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ABSTRACT

This report uses data from the National Longitudinal Transition Study (NLTS) of Special Education Students to identify specific influences on postschool outcomes of youth with disabilities. The first chapter describes the NLTS, summarizes key postschool outcomes for young people with disabilities, and presents a framework suggesting influential factors. The second chapter considers measurement and analysis aspects of the study, including NLTS data sources and the multivariate modeling approach and statistical techniques used. The third chapter addresses nonschool factors in postschool outcomes including disability-related factors, individual traits, and household characteristics. In the fourth chapter, school factors are examined in relationship to postschool outcomes. Among these factors are the amount of instructional time spent in regular education settings, curricular aspects of academic and vocational programming, and transition planning. The fifth chapter discusses three aspects of student outcomes--academic performance, student behavior at school, and social involvement--as related to postschool outcomes. The sixth chapter considers the direct effects of the amount of time since leaving school. The final chapter summarizes key findings, considers the cumulative effects of various factors in postschool outcomes, and looks at particular groups and the pattern of influences experienced by them. An appendix provides supplemental statistical tables. References are included for each chapter. (DB)

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WHAT MAKES A DIFFERENCE? INFLUENCES ON POSTSCHOOL OUTCOMES OF YOUTH WITH DISABILITIES

The Third Comprehensive Report from the National Longitudinal Transition Study of Special Education Students

December 1993

Prepared for:

The Office of Special Education Programs
U.S. Department of Education

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December 1993

Prepared for:

The Office of Special Education Programs
U.S. Department of Education

Prepared by:

Mary Wagner
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Lynn Newman

This last of the many reports from the NLTS is dedicated to the memory of Marian S. Stearns. Mimi, as she was known to friends and colleagues, had a long and distinguished career at SRI. She began SRI's program of research in the special education field, making an important contribution to that field with the first longitudinal study of the implementation of P.L. 94-142. That work, with its standard of excellence and its policy focus, was the foundation on which the NLTS grew. Mimi worked actively on the design of the NLTS, encouraging the staff to maintain a dual focus on "the kids" and "the big picture." She later turned her energies to management challenges at SRI, becoming SRI's first female vice-president, giving leadership to the Health and Social Policy Division. More importantly, she was a cherished friend and mentor to many of the NLTS staff. We grew personally and professionally through our relationships with her. Mimi died in October 1992 of complications of cancer. She was dearly loved and is sorely missed.

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1 POSTSCHOOL OUTCOMES: ANOTHER LOOK

In 1983, the first generation of children to go entirely through elementary school under the provisions of the Education for All Handicapped Children Act (EHA, P.L. 94-142) was approaching secondary school. The secondary school students with disabilities who had preceded them had left school, and disquieting reports were surfacing in some states and communities regarding how they were faring as workers, postsecondary students, and citizens (e.g., Mithaug and Horiuchi, 1983). Graduation and employment rates were low, and so were wages. Most students were not furthering their educations after high school. Social adjustment often was difficult.

How widespread were these problems? Were students with particular characteristics more prone to have difficulty making the transition from school to adult life? What could schools or service agencies do to support students in making that transition more effectively?

The absence of answers to these kinds of questions prompted the U.S. Congress to direct the Department of Education to commission a study of "a sample of handicapped students, encompassing the full range of handicapping conditions, examining their educational progress while in special education and their occupational, educational, and independent living status after graduating from secondary school or otherwise leaving special education" (P.L. 98-199, section 618). In 1985, SRI International, under contract to the Office of Special Education Programs of the U.S. Department of Education, began to develop the design, sample, and instruments for the National Longitudinal Transition Study of Special Education Students (NLTS). In 1987, under a separate contract, SRI initiated the NLTS, the largest single investment in research ever made in the special education field.

Since 1987, the NLTS has helped define much of what we know about the experiences of young people with disabilities nationally while they are in secondary school and in the early years afterward. We now have solid measures of the frequency of critical school experiences, such as patterns of course-taking, receipt of support services, and involvement in regular education classes (Wagner, 1993). We also have accurate indicators of student performance, including absenteeism, grades, performance levels in reading and mathematics, and school completion (Wagner, Blackorby, and Hebbeler, 1993). From the NLTS, we also know the extent to which youth followed various life paths after high school, moving into postsecondary education, employment, residential arrangements of various kinds, and marriage and parenthood (Wagner, D'Amico, Marder, Newman, and Blackorby, 1992). Because the NLTS includes a nationally representative sample of youth, we have solid estimates of these kinds of experiences for young people with disabilities as a whole, and for youth in each of the 11 federal special education disability categories in use in 1985. This is a firm basis for understanding what youth with disabilities experienced in school, how well they did there, and where they went when they left.

But describing students' experiences and their outcomes in school and beyond is only the first step to understanding how public policy, educational programs, and related services can be used more effectively to help young people improve those outcomes. To go further, we need to know what aspects of disability or individual or family background present particular challenges or obstacles to youth in transition. We need to know what experiences in school help students achieve their goals after leaving school, whether those goals involve employment, further schooling, or other roles. We need to know whether some school programs or experiences benefit particular kinds of students most.

Meeting these needs for information regarding what works and for whom is the purpose of this last NLTS report. We continue the explanatory focus of NLTS analyses by considering the questions:

- How did the successful transition of youth with disabilities to postsecondary education, employment, or adult independence relate to aspects of their:
  - Individual or family background
  - Schools or school programs
  - Prior experiences and performance in secondary school?
- How did these relationships differ for youth with different types of disabilities? Did some characteristics of youth or their programs or experiences contribute to postschool outcomes in different ways for youth with different types of disabilities?
- How did these relationships vary over time? Did outcomes improve as time passed after high school? Did some characteristics of youth or their school programs or experiences influence outcomes in different ways soon after high school compared with the later years?

In the remainder of this chapter, we summarize key postschool outcomes for young people with disabilities who had been out of secondary school up to 3 years. We then briefly present the conceptual framework that has guided the NLTS since its inception—a framework that illustrates the factors that experience and prior research suggest influence the outcomes that young people with disabilities achieve after leaving school.

Early Postschool Outcomes of Youth with Disabilities

The subject of postschool outcomes for youth with disabilities currently is receiving considerable attention in the research and policy community, attention that has the potential of expanding considerably our understanding of what constitutes a successful transition to adult life. In the early years of transition research, youth outcomes often were fairly narrowly defined in terms of employment (e.g., Will, 1984). This focus gradually expanded to include and Gaylord-Ross, 1990; Schalock, 1989). Most recently, a broad-based consensus-building process has resulted in a comprehensive definition of postschool outcomes for youth with disabilities that encompasses seven domains (Ysseldyke, Thurlow, and Gilman, 1993):

- Presence and participation in the community
- Physical health
- Responsibility and independence
- Contribution and citizenship
- Academic and functional literacy
- Personal and social adjustment
- Satisfaction.

Whereas other NLTS reports have looked at several of these domains, this report considers outcomes for youth with disabilities in the first domain, presence and participation in the community. Four dimensions of community participation are analyzed here:

- Postsecondary education participation—whether youth had enrolled in a postsecondary academic program (at a 2-year or 4-year college or university) or a postsecondary vocational program (at a 2-year college or vocational school).
- Employment—whether youth were competitively employed, and the total compensation obtained from employment.
- Residential arrangement—whether youth were living independently.
- General community participation—the number of spheres of activity in which youth participated (i.e., engagement in productive activities outside the home, residential independence, social activities) and how fully youth participated (e.g., full-time vs. part-time employment outside the home).

Below, we define more specifically several outcome measures on these dimensions of community participation and describe the status of young people with disabilities on each measure in their first 3 years after leaving secondary school.

Postsecondary Education

Two measures of postsecondary education enrollment are considered here:

- Enrollment in an academic program—whether at any time since the youth left high school s/he had been enrolled in a 4-year college or in a 2-year college program the parent or youth described as primarily academic.
- Enrollment in a vocational program—whether at any time since the youth left high school s/he had been enrolled in a postsecondary vocational school (public or private) or in a 2-year college program the parent or youth described as primarily vocational.

Furthering one's education after high school has provided a bridge for many generations to higher wages and better long-term career prospects. However, youth with disabilities were less likely than their peers in the general population to take advantage of the potential benefits of postsecondary education (Marder, 1992). This fact is of particular concern because the economy of the future is likely to demand that workers be more highly skilled and able to change. NLTS data suggest that, among youth with disabilities out of secondary school up to 3 years, only 16% and 15% of youth had enrolled in academic or vocational postsecondary programs, respectively (Table 1-1). However, youth in some disability categories pursued postsecondary education in greater numbers than others. For example, 54% of youth with visual impairments enrolled in postsecondary academic programs, a rate approaching that of youth in the general population. Almost one-fourth of other health impaired youth and 20% of those with hearing impairments attended postsecondary vocational programs. On the other hand, few youth with mental retardation pursued postsecondary education of any kind. We expect that this variation will have consequences for these youth as they progress through adulthood.

Employment

Two outcomes on the dimension of employment are considered here for youth in their first 3 years after high school:

- Whether the youth currently held a competitive job outside the home for which s/he was paid (sheltered, supported, and volunteer work were not included as competitive paid employment).
- An estimate of the annual total compensation youth received for their work. Unemployed youth were considered to receive no compensation. Estimates for paid workers involved multiplying the reported hours typically worked per week by the reported hourly wage; a typical work year was assumed to involve 49 work weeks for those who did not receive paid sick leave or vacation. For workers who received paid sick leave and vacation, the work year, for purposes of calculating total compensation, was assumed to include 52 paid weeks. Medical insurance received as an employment benefit was valued at 6.1% of wages, as commonly calculated by the U.S. Bureau of the Census (1990).

Follow-up research on the postschool employment status of individuals with disabilities has been conducted at different times and in different geographic regions, and has employed different survey techniques and statistical analyses. In spite of these differences, some of the results have been remarkably comparable. Youth with disabilities as a group are employed at rates well below those of their peers in the general population (Marder, 1992).

On the national level, 55% of youth with disabilities overall were competitively employed when they had been out of secondary school up to 3 years (Table 1-1). This rate, however,

Table 1-1

POSTSCHOOL OUTCOMES, BY DISABILITY CATEGORY

	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Visually Impaired	Hard of Hearing	Deaf	Orthopedically Impaired	Other Health Impaired	Multiply Handicapped
Percentage enrolled in postsecondary academic program since high school	16.5 (2.1)	18.7 (3.3)	15.3 (4.7)	37.0 (6.6)	2.5 (1.6)	53.9 (4.9)	35.0 (4.8)	28.3 (4.3)	30.9 (5.5)	35.1 (7.4)	8.0 (4.0)
Percentage enrolled in postsecondary vocational program since high school	14.7 (2.0)	17.8 (3.2)	13.3 (4.4)	17.9 (5.3)	5.7 (2.4)	14.9 (3.5)	20.0 (4.1)	19.9 (3.8)	13.4 (4.0)	23.5 (6.5)	4.0 (2.9)
Percentage currently competitive employed	55.0 (2.8)	63.1 (4.1)	52.0 (6.5)	58.5 (6.7)	40.8 (5.0)	30.3 (4.5)	43.6 (5.0)	24.8 (4.0)	26.4 (5.2)	47.5 (7.6)	15.8 (5.2)
Average total compensation (dollars, all youth)	5,524 (429)	6,932 (724)	5,310 (926)	4,389 (829)	3,078 (490)	2,027 (448)	2,773 (489)	1,689 (387)	1,636 (467)	4,388 (954)	778 (332)
Average total compensation (dollars, workers)	10,840 (557)	11,671 (808)	11,267 (1,023)	8,145 (1,087)	8,274 (701)	7,303 –	7,596 (811)	8,897 (906)	7,586 –	9,723 –	–
Percentage living independently	27.8 (2.5)	33.9 (4.0)	21.1 (5.1)	36.4 (6.3)	14.8 (3.5)	39.3 (4.7)	25.9 (4.4)	32.3 (4.3)	16.6 (4.3)	17.2 (5.7)	8.0 (3.9)
Percentage fully participating on three dimensions (Profile A)	16.7 (2.1)	20.6 (3.4)	11.1 (4.1)	27.4 (6.2)	6.9 (2.6)	28.7 (4.4)	19.4 (4.0)	18.1 (3.6)	7.3 (3.1)	11.6 (5.0)	2.8 (2.4)
Percentage fully participating on two dimensions (Profile B)	47.8 (2.8)	53.3 (4.2)	44.7 (6.5)	51.2 (6.9)	35.4 (4.9)	44.0 (4.9)	37.2 (5.8)	39.3 (4.6)	37.2 (5.8)	53.2 (7.8)	22.8 (6.1)
Percentage not active in the community (Profile E)	18.2 (2.2)	14.2 (3.0)	21.2 (5.4)	10.2 (4.2)	28.9 (4.7)	14.1 (3.4)	12.2 (3.3)	28.9 (4.3)	26.8 (5.3)	10.5 (4.8)	30.5 (6.6)
n	1,763	265	119	115	188	235	211	253	161	101	100

---

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

varied dramatically by disability category. For example, the employment rate of 63% for youth with learning disabilities resembled that of peers in the general population. At the other end of the spectrum, only 16% of youth with multiple handicaps and 25% of deaf youth attained competitive employment. Similar variations are observed regarding total compensation. Overall, almost half of youth with disabilities who had been out of secondary school up to 3 years reportedly received no compensation, a rate that ranged from 41% of students with learning disabilities to 86% of those with multiple impairments. The average compensation for all youth, including those who were not employed, was $5,524; those employed for pay earned an average annual compensation, including wages and benefits, of $10,840. Working youth in most disability categories earned less than $10,000 annually.

Residential Independence

Residential independence is defined in the NLTS as living alone, with a spouse or roommate, in a college dormitory, or in military housing (not as a dependent).

Community integration and independent living have been core outcome areas since the beginning of the transition initiative. The ability to live on one's own is believed to be evidence of the ability of youth to perform many common adult tasks. Paying bills, preparing meals, etc., are all indicative of functioning adults. Fewer youth with disabilities were living independently shortly after secondary school than were peers in the general population (Marder, 1992). NLTS analyses showed that 28% of youth with disabilities were living independently in their first 3 years after secondary school (Table 1-1). One-third or more of youth with speech or visual impairments or those who were deaf lived independently, whereas only 8% of their peers with multiple handicaps and 15% of those with mental retardation did so.

Community Participation

Although the outcomes described above illustrate specific dimensions of the experiences of youth with disabilities, we recognize that an integrated picture of the whole of their experience cannot be drawn by concentrating only on its parts. The fabric of youths' lives is a complex interweaving of their activities and experiences with work, school, family, friends, and living arrangements. The NLTS has developed an outcome measure that attempts to draw a fuller picture of the lives of young people with disabilities—going beyond their individual activities to examine how their experiences with community participation blend, how they sum up to make the whole.

The NLTS has developed a measure of community participation that encompasses the extent to which youth were functioning independently in the community along three important dimensions:

- Engagement in work- or education-related activities outside the home. Were youth engaged in work, schooling, or job training? To what extent (i.e., full time, part time, volunteer work, sheltered jobs)?
- Residential arrangements. Were youth living independently? With family members? In institutions?
- Social activities. Were youth socially isolated—not seeing friends, belonging to groups, or establishing relationships through engagement or marriage?

The NLTS measure of youths' general community participation captures the extent to which youth were participating across these dimensions (e.g., participating on engagement and residential dimensions vs. the engagement dimension alone) and indicates how independently youth were functioning on a particular dimension (e.g., whether youth were working full time for pay vs. doing volunteer work; whether youth were living independently or in supervised settings). The measure is conceptually ordinal; that is, it progresses logically from lesser to greater participation. Such an ordinal measure allows the charting of youths' movement over time as they increased, maintained, or decreased their general community participation.

The resulting NLTS construct of general community participation is referred to as "life profiles," snapshots of the interrelated statuses of youth on the engagement, residential, and social dimensions. They are a priori clusters of experiences of youth that "hang together" both in the world and in NLTS data. An interactive process of defining profiles, fitting data, refining definitions, and conducting further analyses has produced a set of six profiles of youth with disabilities that capture a continuum of participation on the three dimensions of interest. Here, we analyze the extent to which youth achieved the first two profiles (A or B), which are associated with the greatest degree of community participation. We also consider the extent to which youth were characterized by profile E, the lowest level of community participation short of institutionalization. These profiles are briefly described below. (See Wagner, 1992, for a more complete analysis of all six life profiles for youth with disabilities.)

Profile A Youth participated fully on all three dimensions. This profile describes youth who were productively engaged full time outside the home, were living independently, and were socially active. On the engagement dimension, the vast majority of youth who fit profile A were employed in competitive, full-time jobs, with a small number working competitively part time, in combination with either job training or postsecondary education. The majority of these youth lived with a spouse or roommate, consistent with the high rate of marriage or living with persons of the opposite sex among youth who fit this profile. Overall, 17% of youth with disabilities who had been out of secondary school up to 3 years fit this profile. Only among youth with visual or speech impairments or learning disabilities did at least 20% of youth reach this highest level of community participation (20% to 29% of youth in these categories), whereas only 3% of youth with multiple impairments and 7% of youth with orthopedic impairments were fully involved in their communities on all three dimensions.

Profile B Youth were participating fully on two dimensions. For example, youth were working competitively full time or were full-time students and were involved socially, but lived at home with parents (and thus were not participating on the residential dimension). Alternatively, youth were married (socially participating) and lived with their spouses (residentially participating), but were not working or working less than full time (not fully engaged outside the home). Youth also could have been fully participating on the engagement and residential dimensions, but socially isolated. Table 1-1 shows that 48% of youth fit this profile when they had been out of secondary school up to 3 years, making it the most common cluster of youth experiences. This profile characterized more than half of youth with speech or other health impairments or with learning disabilities, but only 23% of youth with multiple impairments and about one-third of youth with mental retardation.

Profile E Youth were not participating on either the engagement or residential dimension, but were not living in institutions. These youth were not involved in any work- or education-related activities outside the home and generally lived with parents or other adult family members. Despite their lack of involvement in work or school or in living situations outside their immediate families, few were socially isolated. This profile characterized 18% of youth who had been out of secondary school up to 3 years. This profile was least characteristic of youth with speech impairments (10%), but characterized almost one-third of youth with multiple impairments.

A Conceptual Framework of Influences on Postschool Outcomes

Since its inception, the NLTS has considered the kinds of postschool outcomes of young people with disabilities discussed above within the broader context of a transition process that begins in secondary school and extends through the early years of adulthood. Figure 1-1 depicts the conceptual framework of this transition process. It denotes postschool outcomes (Box E) as the products of transition, which are influenced by several categories of factors related to youth and their earlier experiences. Chief among these are characteristics of the individual and the household from which he or she comes, depicted in Box A of the conceptual framework. Disability-related factors and their influence on postschool outcomes are discussed in Chapter 3, as are the relationships of postschool outcomes to other demographic characteristics of youth and their households of origin.

Boxes B and C suggest aspects of students' schools and school programs that can influence students' performance in school as well as their success in their postschool transitions. Chapter 4 discusses relationships observed in the NLTS between postschool outcomes and selected characteristics of students' schools and school programs.

The factors in Box D and the arrow indicating a direct relationship between them and postschool outcomes suggests that outcomes during students' school years contribute to success in later life. Chapter 5 examines relationships between postschool outcomes and

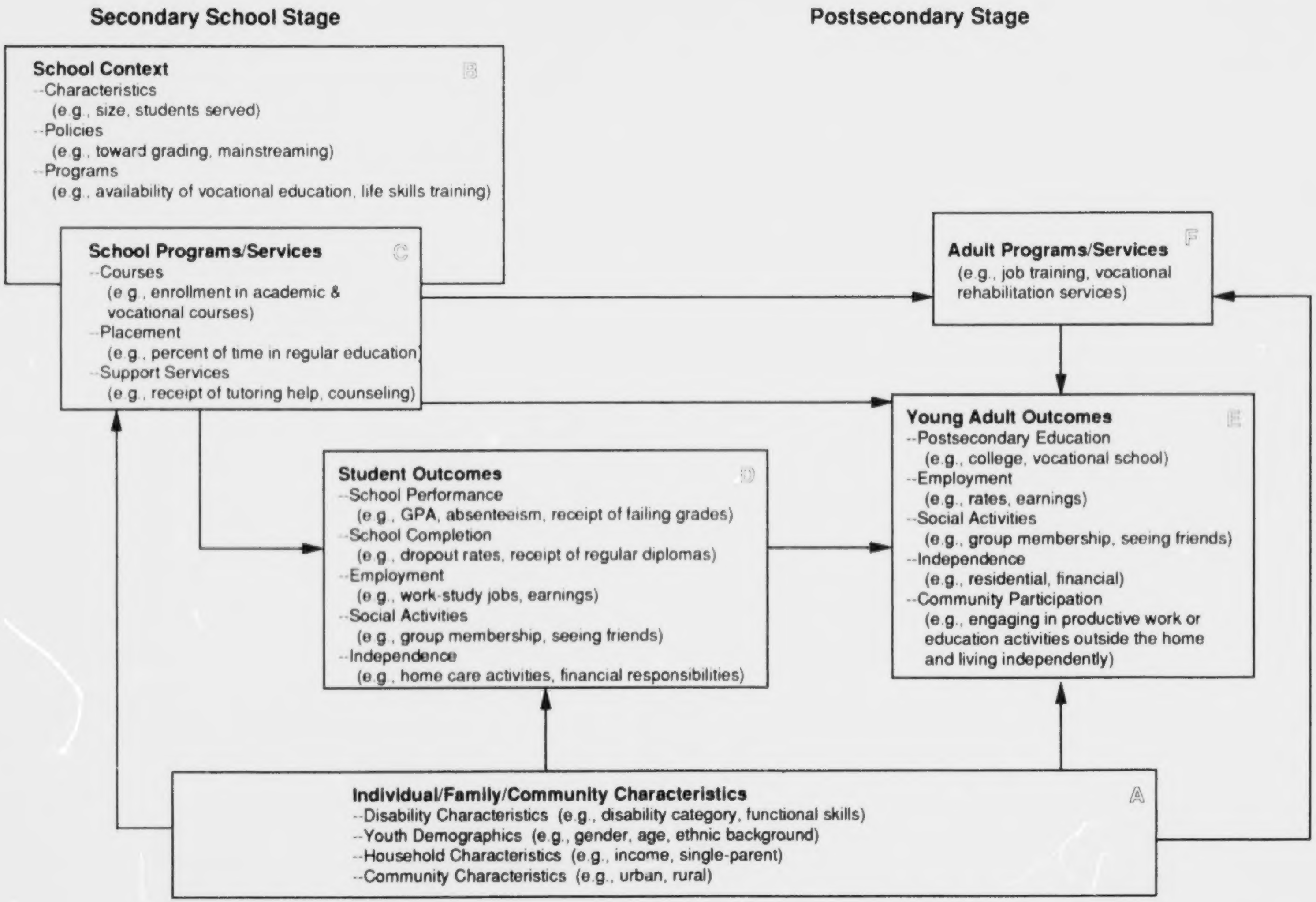
Secondary School Stage
Postsecondary Stage
School Context
B
--Characteristics
(e.g., size, students served)
--Policies
(e.g., toward grading, mainstreaming)
--Programs
(e.g., availability of vocational education, life skills training)
School Programs/Services
C
--Courses
(e.g., enrollment in academic & vocational courses)
--Placement
(e.g., percent of time in regular education)
--Support Services
(e.g., receipt of tutoring help, counseling)
Adult Programs/Services
F
(e.g., job training, vocational rehabilitation services)
Student Outcomes
D
--School Performance
(e.g., GPA, absenteeism, receipt of failing grades)
--School Completion
(e.g., dropout rates, receipt of regular diplomas)
--Employment
(e.g., work-study jobs, earnings)
--Social Activities
(e.g., group membership, seeing friends)
--Independence
(e.g., home care activities, financial responsibilities)
Young Adult Outcomes
E
--Postsecondary Education
(e.g., college, vocational school)
--Employment
(e.g., rates, earnings)
--Social Activities
(e.g., group membership, seeing friends)
--Independence
(e.g., residential, financial)
--Community Participation
(e.g., engaging in productive work or education activities outside the home and living independently)
Individual/Family/Community Characteristics
A
--Disability Characteristics (e.g., disability category, functional skills)
--Youth Demographics (e.g., gender, age, ethnic background)
--Household Characteristics (e.g., income, single-parent)
--Community Characteristics (e.g., urban, rural)

FIGURE 1-1 CONCEPTUAL FRAMEWORK OF TRANSITION EXPERIENCES AND OUTCOMES OF YOUTH WITH DISABILITIES

youths' academic performance, school-related behaviors, and social involvement during their secondary school years.

We then consider the time span of the transition process. Other NLTS work has demonstrated improvements in many aspects of postschool outcomes as youth spent a greater amount of time out of school (Wagner et al., 1992). Chapter 6 further considers the effects of time by describing its relationship as an independent variable to the outcomes of interest, and by reporting changes in the ways other factors influence outcomes as youth distance themselves in time from high school.

The final chapter summarizes what we have learned about what makes a difference for youth in transition to adulthood. Implications for policy and programming are suggested.

References

Halpern, A. S. (1985). Transition: A look at the foundations. *Exceptional Children, 51*(6), 479-486.

Marder, C. (1992). *How well are youth with disabilities really doing? A comparison of youth with disabilities and youth in general. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Mithaug, D. E., and Horiuchi, C. N. (1983). *Colorado statewide followup survey of special education students*. Denver, CO: Colorado Department of Education.

Park, H., Cameto, R., Tappe, P. M., and Gaylord-Ross, R. (1990). Social support and quality of life for learning disabled and mildly retarded youth in transition. In Gaylord-Ross, R., Siegel, S., Park, H., Sacks, S., and Goetz, L. (Eds.), *Readings in ecosocial development*. San Francisco: San Francisco State University.

Schalock, R. L. (1989). Quality of life: Its measurement and use. *Mental Retardation, 27*(1), 25-32.

U.S. Bureau of the Census. (1990). *Statistical abstract of the United States, 110th edition*. Washington, DC: Author.

Wagner, M. (1992). More than the sum of the parts: Life profiles of out-of-school youth with disabilities. In Wagner, M., D'Amico, R., Marder, C., Newman, L., and Blackorby, J., *What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Wagner, M. (Ed.). (1993). *The secondary school programs of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Wagner, M., Blackorby, J., and Hebbeler, K. (1993). *Beyond the report card: The multiple dimensions of secondary school performance of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Wagner, M., D'Amico, R., Marder, C., Newman, L., and Blackorby, J. (1992). *What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Will, M. (1984). *OSERS programming for the transition of youth with disabilities: Bridges from school to working life*. Washington, DC: Office of Special Education and Rehabilitative Services.

Ysseldyke, J. E., Thurlow, M. L., and Gilman, C. J. (1993). *Educational outcomes and indicators for individuals at the post-school level*. Minneapolis, MN: National Center on Educational Outcomes.

2 MEASUREMENT AND ANALYSIS CONSIDERATIONS

The NLTS has produced both a database that is intended for multiple uses and numerous reports that contain a variety of analyses for different subsamples of youth. This chapter provides an overview of methodological issues pertinent specifically to the analyses of postschool outcomes reported here. For more information on the design, sampling, or measurement of the NLTS more broadly, see Wagner, Newman, and Shaver (1989) regarding data collection procedures for the first wave of NLTS data and Marder, Habina, and Prince (1992) for the second wave. Sampling issues are presented in greater detail in Javitz and Wagner (1990 and 1993).

This chapter first describes the sources of NLTS data used in this report and measurement issues related to those data. Our analytic subsamples and our approach to weighting the NLTS data to generalize to the population of student with disabilities is then described, including a discussion of estimating standard errors to account for the stratified sample of the NLTS. Finally, we describe important analysis and interpretation considerations including our multivariate modeling approach, statistical techniques, and the relative fit of the multivariate models that are the focus of this report.

Data Sources

Findings regarding the broad range of youth experiences presented in this report are based on data derived from multiple sources:

- Parent/student telephone interviews. In 1987, parents and, in 1990, the parents and student (if the latter were able to respond for themselves) were administered a structured interview by telephone to obtain information on services received by students and outcomes in the areas of employment, education, and independence. Interview data also were the source of student and household demographic information, such as gender, ethnic background, and household income.
- **Secondary school transcripts.** High school transcripts were sought for all sample students who attended secondary school after the 1986-87 school year.
- **School program content forms**. For students whose school programs were not recorded on transcripts, school program content forms were completed by teachers familiar with students' programs. These were sought in 1990 for the most recent school year for all students who had been in secondary school at all since the 1986-87 school year.
- **Student school program survey**. For all students still in school in the 1990-91 school year and for those students leaving school in the 1988-89 and 1989-90 school years who were classified as learning disabled, speech impaired, seriously

emotionally disturbed, or mildly/moderately mentally retarded,[*] teachers were surveyed regarding their performance expectations for students and more detailed aspects of those students' school programs (this instrument is included in Marder, Habina, and Prince, 1990).

Measurement Issues

The subsequent analytic chapters of this report present information regarding the measurement of specific variables used in those chapters. However, several general points about NLTS measures used in multiple chapters also should be clear to readers as they consider the findings reported here.

Combining data from multiple sources. Variables used in the analyses reported here combine data from various of the sources noted above. For example, determining whether a student dropped out of school used data from school records and/or parent/youth interviews; thus, statistical such as the percentage of students dropping out aggregate data from these multiple sources. See Wagner et al. (1991) for an analysis of issues related to combining data from various sources; results fail to provide evidence against maximizing the data by combining them from different sources when appropriate.

Categorizing students by primary disability category. Information about the nature of students' disabilities came from rosters of all secondary school students in special education that were submitted by school districts included in the study. In all tables in this report, youth were assigned to a disability category based on the primary disability designated by the student's school or district in the 1985-86 school year. Definitions of disability categories and criteria for assigning students to them vary from state to state and even between districts within states. Because we have relied on category assignments made by schools and districts, NLTS data should not be interpreted as describing youth who truly had a particular disability, but rather as describing those who were categorized as having that disability by their school or district. Hence, descriptive data are nationally generalizable to youth who were classified as having a particular disability in the 1985-86 school year.

Demographic characteristics. Findings in this report are provided for youth who differed in gender, ethnic background, and household income. For the majority of students, these measures were taken from interviews with parents in 1987. For a small number of youth, interviews could not be completed in 1987, but were completed in 1990. For these youth, demographic characteristics were obtained in the 1990 interviews. To the extent that household income was different between 1987 and 1990, some degree of measurement error is introduced, which may reduce the strength of association with other youth experiences. Regarding ethnic background, only the categories of white, African American, and Hispanic had enough youth to report findings for those categories separately. Youth of other ethnic backgrounds are included in the samples of all students, of disability categories, of gender, and of household income, but are not reported separately by ethnic background.

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[*] The surveys in 1988 and 89 were part of a special study done for students in these categories only.

Types of courses. Several independent variables in the analyses involve the types of courses youth took in high school. Courses listed on students' transcripts were coded into course content areas using a modified version of the Classification of Secondary School Courses coding system developed for the National Center for Education Statistics (NCES) in 1982, and the Special Education Course Classification and Coding System developed for NCES and the National Assessment of Vocational Education. Those systems permit distinguishing courses at a fine level of detail. However, to take advantage of that level of detail, course catalogs giving descriptions of course content, prerequisites, or skill levels would be required. Obtaining catalogs from the almost 2,000 schools attended by NLTS sample members was infeasible. Therefore, course types were coded directly from course titles on transcripts, which required groups courses for analysis into fairly gross categories.

Placement. The extent to which youth took courses in regular education is an independent variable in these analyses. In many cases, special education classes were designated clearly on transcripts. Nevertheless, school staff were asked to annotate each student's transcript so that the placement for each course was clear. (See Marder, Habina, and Prince, 1992, for copies of annotation instructions and all other data collection instruments for the second wave of NLTS data collection.)

School completion. School leaving status, an independent variable in these analyses, was determined from school reports when these were available. In the absence of a complete school record or school-leaving report from a school, parent or student reports were used. Other analyses of NLTS data revealed a high level of agreement between parent/student reports and school reports when both sources of information about school-leaving status were available (Wagner et al., 1991, Appendix C).

Analytic Subsamples

The analyses in this report involve two subsamples of NLTS youth: those having data related to postschool outcomes, and a subset of youth having information gathered from the survey of teachers.

Postschool Outcomes. This subsample is designed to maximize information regarding the relationship of school programs and outcomes in the seven areas that are the focus of this report. Youth in this subsample were required to satisfy three conditions:

- They were enrolled in school during the 1987 school year and were out of school (graduated, dropped out, or aged out) by 1990.
- They had data from parent interviews in Wave 1 and parent or student interviews in Wave 2.

- Data were available from a transcript for the time they were in school, and/or from a school program content form for either an ungraded program or grade levels 9, 10, 11, and/or 12.
- They were not institutionalized in 1990.

A sample of 1,888 students met these criteria. However, not all youth appear in any single analysis or model, largely due to missing data for some the variables relevant to this report.

Teacher reports. The second major subsample has data from the student school program survey on teachers' perceptions regarding several aspects of students' secondary school programs and supports, as well as of students' behavior in school. Students in this subsample were required to satisfy the following conditions:

- They were enrolled in school during the 1987 school year and were out of school (graduation, dropping out, or aging out) by 1990.
- They had data from parent interviews in 1987 and parent or student interviews in 1990.
- Data were available from a transcript for the time they were in school, and/or from a school program content form for either an ungraded program or grade levels 9, 10, 11, and/or 12.
- They were not institutionalized in 1990.
- They had a student school program survey.

It was not feasible to collect these more detailed survey data from all students in all schools each year. Hence, only students met the criteria for this subsample.

The actual number of cases involved in any particular analysis is determined by the overlap in data sources for the variables used in the analysis and the amount of missing data for particular items. Table 2-1 depicts the number of cases included in each multivariate analysis reported in the following chapters.

Weighting the NLTS Data

In describing postschool experiences of youth with disabilities, we generally report percentages of youth with a particular status or experience (e.g., the percentage obtaining competitive employment). Percentages are weighted to represent youth nationally; they are not percentages of the sample, but estimates for the population of youth with disabilities as a whole and for those in each of 11 federal special education disability categories. Youth were weighted to represent all those enrolled in special education in the 1985-86 school year. In other words, rather than counting each individual in the NLTS equally in calculating percentages, each person's value for a variable is weighted proportionate to the number of youth like him/her in the full population of youth with disabilities nationally. Hence, for example, values for youth with learning disabilities are weighted more heavily than those for

Table 2-1

SAMPLE SIZES OF THE MAIN AND EXTENDED MODELS

		Disability Cluster Models			
	Main Model	Mild	Sensory	Physical	Severe
Postsecondary academic education	1,208	490	429	163	127
Postsecondary vocational education	1,208	489	429	163	127
Competitive employment	877	512	445	165	133
Total compensation	793	454	406	151	129
Independent living	1,227	498	437	167	127
Profile A or B	1,227	498	436	163	130
Profile E	1,227	498	436	163	130

youth with visual impairments when discussing youth as a group because of the significantly greater number of youth with learning disabilities in the population as a whole.

Table 2-2 illustrates the concept of sample weighting and its effect on percentages or means that are calculated for youth with disabilities as a group. In the example in Table 2-2, 10 youth are included in a sample, 1 from each of 10 disability groups, and each has a hypothetical value regarding whether that student was competitively employed (1 for yes, 0 for no). Four students were employed, which would result in an unweighted sample percentage of 40% having jobs. However, this would not accurately represent the national population of youth with disabilities because many more youth are classified as learning disabled or mentally retarded than orthopedically or other health impaired, for example. Therefore, in calculating a population estimate, we apply weights in this example that correspond to the proportion of youth in the population that are from each disability category (actual NLTS weights account for disability category, age, and several other aspects of youth and the schools or districts from which they were chosen, as specified in Javitz and Wagner, 1990). The simple weights for this example appear in column C. Using these weights, the weighted sample percentage is 61% being competitively employed. The percentages in all NLTS tables are weighted population estimates (similar to the 61% in column D of Table 2-2), whereas the sample sizes are the actual number of cases on which the weighted estimates are based (similar to the 10 cases in column A of Table 2-2).

Table 2-2

EXAMPLE OF WEIGHTED PERCENTAGE CALCULATION

Disability Category	A Number in Sample	B Was Competitively Employed*	C Weight for Disability Category	D Weighted Value for Category
Learning disabled	1	1	5.6	5.6
Emotionally disturbed	1	0	1.1	0
Speech impaired	1	1	.3	.3
Mentally retarded	1	0	2.4	0
Visually impaired	1	1	.1	.1
Hard of hearing	1	1	.1	.1
Deaf	1	0	.1	0
Orthopedically impaired	1	0	.1	0
Other health impaired	1	0	.1	0
Multiply handicapped/deaf-blind	1	0	.1	0
TOTAL	10	4	10	6.1

Unweighted percentage = 40% (Column B total divided by Column A total)

Weighted percentage = 61% (Column D total divided by Column C total)

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*Yes = 1; No = 0

NLTS sample weighting involved deriving weights for all youth for whom data were available in 1987 from parents or school records, as described in Javitz and Wagner, 1990. Wave 1 weights provide the best estimate of the characteristics of the whole population of youth with disabilities who had been secondary school special education students in the 1985-86 school year.

To reweight the subsample of 1,888 youth used in the analyses postschool success, we first identified the group of youth we wished to represent--those who (1) were enrolled in special education in the 1985-86 school year, (2) were enrolled in a secondary school in the 1985-86 or 1986-87 school years, (3) had 1987 parent interview data, and (4) were not institutionalized in 1987. This group of 1,888 youth, weighted with their wave 1 weights, provided the best picture available of the characteristics of the population of youth to which the subsamples of youth should generalize.

We then used the group of 1,888 youth and their wave 1 weights to calculate the following characteristics of the population as of 1987:

- **Disability**—grouped using the 11 federal special education disability categories: learning disabled; seriously emotionally disturbed; speech impaired; mentally retarded; visually impaired (partially sighted or blind); hard of hearing; deaf; orthopedically impaired; other health impaired; and multiple (multiply impaired or deaf/blind). Disability category was designated by schools or districts from which students were sample originally.
- **Age**—the categories were students born in the years 1970-72; 1967-69; and 1966 or before. Age was determined from parent reports and/or school records.
- **Ethnic background**—grouped as African American, white, Hispanic, and a combined category for Native American/Alaskan native, Asian/Pacific Islander, and "other." In addition, there was a category for unknown ethnic background, which included "don't know," refusals, and any other missing data. Parent reports or, if parent interviews were missing, school records were the source of ethnic background data.
- **Gender**—as reported by parents or, if no parent interview was obtained, as found on school records.
- **Annual household income**—grouped as under \$12,000; \$12,000 to \$25,000; and more than \$25,000. Those with incomes of \$25,000 or less but otherwise unspecified were grouped with those with household incomes under \$12,000. In addition, there was a category for those with missing information, which included those who responded "don't know," refused to answer, indicated that the student was institutionalized, and any other missing values. Income was determined from parent reports.

The third step was to calculate weights for the subsamples of youth so that they matched the demographic distributions of the 1,888 youth on the characteristics listed above. The weighting was accomplished using Deming's algorithm, which iteratively modified the wave 1 weights for the youth in each of the subsamples until they generated demographic distributions that were very similar to those of the youth used to estimate the population. Each disability category was weighted separately; the distributions of the smaller subsamples matched the larger sample within a fraction of 1%.

Estimating Standard Errors

Because the NLTS involves a sample of youth with disabilities from which estimates are made for the broader population of youth, it is important to determine the statistical variability of the population estimates—i.e., how precisely are we estimating from our sample the characteristics of the population to which the NLTS generalizes? If, for example, weighted NLTS data indicate that 61% of the population of youth with disabilities found competitive employment after secondary school, we need to know how close that estimate is to the true level of employment that would be measured for the whole population of youth. A standard error indicates the precision of the estimates; standard errors are reported in all data tables in NLTS documents to permit readers to understand the range of variability of the estimates provided.

To elaborate, the standard error of the estimate of 61% employment used as an example above might be 3%. In this example, we would be confident that, 95 times out of 100, the actual percentage of the national population of youth with disabilities who found jobs after school would be 61%, plus or minus 1.96 times 3%, or between 55% and 67%. The width of this interval reflects the fact that the 61% estimate is based on only a sample of youth, and the "luck of the draw" could result in our selecting proportionately somewhat more or fewer youth who found jobs than in the national population.

Standard errors for the NLTS were computed using a procedure that differs somewhat from standard calculation routines. Standard routines assume a simple random sample, whereas the NLTS has a stratified cluster sample, which increases the standard errors of estimates compared with a simple random sample. In addition, the reweighting of the 1990 data introduced a small amount of additional variability.

Pseudo-replication is widely accepted as a variance estimation technique for databases that have the sample characteristics of the NLTS. However, it is not cost-effective for estimating the standard errors of the thousands of variables and subpopulations tabulated in the numerous NLTS reports. Therefore, pseudo-replication was conducted on a limited number of variables to calibrate a cost-effective approximation formula. The procedures used in this calibration are described in Javitz and Wagner (1990). These procedures generated the standard errors reported for percentages of youth with particular experiences at a given point in time (e.g., the percentage of youth with a competitive job within 3 years of leaving high school).

Analysis Issues and Strategy

Current Analyses vs. Previous NLTS Analyses

Although the focus of this report is the multivariate relationship between individual and school factors and postschool outcomes, we provide throughout the report descriptive information to provide context for the explanatory analyses. Whether currently used as a dependent or an independent variable, each of these factors has been described in previous NLTS reports. In some instances, the specific point estimates presented here differ from those that have appeared in other reports. These differences are due to differences in the subsample of NLTS youth for specific reports. For example, the employment rate of the current sample of youth out of school up to 3 years is approximately 55%, which is between the two rates referred to in Wagner, D'Amico, Marder, Newman, and Blackorby (1992), which considered youth who had been out of school up to 2 years and then again when they had been out of school 3 to 5 years. Logically, the rate reported here would be between the rates reported earlier, just as the youth analyzed here were temporally between the two subsamples of youth reported about earlier.

There also are other important differences between the two sets of analyses that in some instances result in different findings. First, current analyses go beyond earlier work in that previous multivariate analyses involved measures of students' school programs or performance that were based on a single year of data. The current analyses take advantage of school transcripts that allow a more complete picture of school programs. Thus, our current analyses include variables that were unavailable during analysis of the first year of data. Further, we can now evaluate, for example, if the strength of independent variable accumulated over time.

Modeling Process

The main multivariate analyses presented in this report were derived directly from the NLTS conceptual framework (Chapter 1). That is, they seek to illuminate the relationships between the independent variables of disability, demographic, family, school program, and performance variables to a series of postschool measures (see Table 2-3). For this report in particular, there was reason to believe that there might be disability-specific relationships. For example, dropping out of school might be a greater problem for some youth than others. Further, teacher-reported data regarding in-class behavior were only available for a subset of the sample. These factors led us to a three stage modeling process: Main models, disability group models, and extended models using teacher survey data. Each of these is described in more detail below.

Main model. The main models form the core of the analyses presented in this report. Seven separate models explain each of the seven dependent variables with a common set of independent variables (Table 2-3). The results are presented by chapter in related areas despite the fact that they derive from the same analyses.

Disability group models. It is reasonable to expect that the impact of some aspects of school programs would differ for youth in different disability categories. To identify such differences, it would have been desirable to perform multivariate analyses for each of the 11 disability categories. However, sample size limitations precluded that approach. Thus, we grouped youth into 4 clusters of related disabilities in the following way: (1) youth with learning disabilities, serious emotional disturbances, speech impairments or mild mental retardation comprise the mild cluster; (2) youth with hearing or visual impairments comprise the sensory disability cluster; (3) youth with orthopedic or other health impairments comprise the physical disability cluster; and (4) deaf/blind youth, and youth with moderate or severe mental retardation or multiple handicaps comprise the severe cluster. In some cases, a secondary disability qualified youth for a cluster other than that associated with a primary disability. For example, a youth with a hearing impairment who also was moderately mentally retarded would be assigned to the severe cluster because of the level of mental retardation. Table 2-3 depicts the number of youth from each of the 11 disability categories that were assigned to each of the

Table 2-3

FACTORS INCLUDED IN MULTIVARIATE ANALYSES

Variable	Description
Main Model	
Disability category	9 dichotomous variables (see Table 3-1)
Self-care skills scale score	Scale ranges from 3 to 12
Functional mental skills scale score	Scale ranges from 4 to 16
Gender	Dichotomous (1=male)
Household income	5 category scale
Household composition	Dichotomous (1=2-parent)
African American	Dichotomous
Hispanic	Dichotomous
Years out of secondary school	Ranges from 1 to 3
Was a father/mother	Dichotomous
Attended a special school	Dichotomous
Was a vocational concentrator	Dichotomous
Took vocational survey courses	Dichotomous
Participation in work experience program	Dichotomous
Took college preparatory classes	Dichotomous
Percentage of class time in regular education	Ranges from 0 to 100
Dropped out	Dichotomous
Frequency saw friends outside of school	Scale ranges from 1 to 5
Belonged to group in high school	Dichotomous
Percentage of student body in poverty	Ranges from 1 to 4
Parent expectations for children's future	Dichotomous (1=positive expectation)
Cluster models	
All variables above except disability category and, for some clusters and some outcomes, variables that failed to have sufficient variance to use in those particular analyses	
Extended models	
Parent involvement in children's education	Scale ranges from 1 to 4
Differential in years between student grade level and math and reading abilities when tested	Positive differential=above grade level; 0 differential=at grade level; negative differential=below grade level
Grade point average	Ranges from 0 to 4
Teacher ratings of student's behavior in class	Scale ranges from 1 to 6
Teacher ratings of student's attention to school-related tasks	Scale ranges from 1 to 7
Student had transition plan	3 categories: none, informal, written plan
Student had transition goal of postsecondary academic education, postsecondary vocational education, competitive employment	3 variables, each dichotomous
In transition planning, school contacted 2- or 4-year colleges, vocational schools, and potential employers on behalf of student	3 variables, each dichotomous

4 clusters. (See Wagner et al., 1991, Appendix C for a discussion of the analyses that support assignment to clusters.)

The independent variables in the cluster analyses were identical to those in main models except for instances in which youth in a particular disability cluster did not have sufficient variation on an independent or dependent variable, requiring that those variables be dropped from the analyses or, in the case of dependent variable, that the analyses not be conducted at all.

Extended models. The data regarding secondary programs and performance in the main and cluster models are largely based on student transcripts and have the advantage of allowing a longitudinal look at the experiences of youth with disabilities in secondary schools. Transcripts, of course, have limitations inasmuch as they contain little information concerning youth behavior. These issues are addressed in our extended models that include data from a survey of teachers. However, the teacher survey data were collected as part of a substudy for only a subset of youth representing only those classified as learning disabled, mildly/moderately mentally retarded, speech impaired, or emotionally disturbed who had remained in school until at least 11th grade. They may be a more academically successful group than those who dropped out of school before 11th or 12th grade. Therefore, our statements regarding the extended model should be applied only to that subset of youth.

Our process for introducing the teacher survey factors was as follows: We began with the original set of variables from the main models to establish that the subset of students with teacher survey data was similar to the larger group for that set of independent variables. We then constructed additional models for each of the factors (e.g. reading ability) by adding the relevant variables. Thus, there are many additional models based on the teacher survey. Statistics are reported only for the added variables, not for all variables included in each extended model.

Multivariate Analysis Techniques

Most of the descriptive analyses presented in this volume are based on crosstabulations of two or three variables. However, interrelationships among variables limit our ability to disentangle the independent relationships among intercorrelated independent variables and an outcome of interest. Multivariate analysis techniques have been employed when our purpose was this identification of independent relationships. Multivariate analysis is an invaluable analytic technique in the social sciences precisely because of its ability to disentangle the separate impacts of multiple predictor variables. Suppose, for example, that we were interested in knowing the relationships that household income and minority status have to postschool residential independence. Because household income and minority status are themselves interrelated, we would need some way of distinguishing between the separate effects of each factor. Multivariate analysis techniques perform this function. Ordinary least squares regression analysis and logit analysis are the two techniques that have been used in this volume; each is discussed below.

Ordinary Least Squares Regression Analysis

Ordinary least squares regression analysis is used to consider the relationships of a variety of independent variables to a continuous dependent variation, such as the total compensation youth received in return for their labor. Ordinary least squares regression analysis is based on the following form of model:

$$Y = a + b_1X_1 + b_2X_2 + e \qquad (1)$$

where:

Y is the outcome variable, which in this case we measured as dollars earned,

X_1 and X_2 are the independent variables. In this example, let us suppose that the first of these is the household's annual income and the second is coded 1 for those who are members of minority groups, and 0 for nonminorities,

a, b_1 and b_2 are coefficients to be estimated, and

e is the error term, reflecting the fact that an outcome generally will not be completely determined by the included independent variables (i.e., there is a stochastic component to the relationship).

The coefficients, b_1 and b_2, represent the separate effects of household income and minority status, independent of the influence of the other. Specifically, b_1 represents the effect of household income on compensation, holding constant the effect of minority status (i.e., it represents the effect of household income among youth who either were all minority or all nonminority), and b_2 represents the effect of being minority rather than nonminority among youth whose households all had equivalent incomes. These coefficients can be readily interpreted as showing the amount by which the outcome is expected to change for each one-unit change in the independent variable. Thus, if household income were measured in thousands of dollars, a youth's compensation would be expected to change by amount b_1 for each one thousand dollar increase in household income.

Of course, other techniques also could have been used to sort out these separate impacts. A three-way crosstabulation (categories of wage levels by categories of household income by minority status), for example, also would be very informative and might be preferred in descriptive or exploratory work when our knowledge of the nature of the relationship between independent and dependent variables is weak. But the use of crosstabulations often will confront us with dwindling cell sizes for all but the simplest problems, and regression analysis generally yields significance tests that are substantially more powerful, in a statistical sense (i.e., we are more likely to reject the null hypothesis of no relationship when there really is a relationship).

The advantages of regression analysis can be fully realized, however, only if its underlying assumptions hold. Among these assumptions are that the equation correctly specifies the relationship between the independent and outcome variables and that the error term, e, has an expected value of zero and a constant variance. Although regression is robust in the face of violations of these assumptions, the case of dichotomous dependent variables gives rise to problems that are especially egregious for at least several reasons.

First, the assumption of linearity seems untenable. Regression techniques assume that the effect of each variable is constant throughout all of its own values and all values of the other variables. For example, in the equation above, it is assumed that the effect of household income, b_1, is the same for minority and nonminority youth, and, further, that compensation is affected equally regardless if the one-unit change in household income represents a difference between $10,000 and $11,000 or a difference between $50,000 and $51,000. Similarly, the difference between the dollars earned by minority and nonminority youth is estimated to equal b_2, regardless of whether we are evaluating the difference among youth from high-income or low-income households.

The assumption of linearity may hold at least approximately in many cases, and slight adjustments to a regression model (e.g., the inclusion of quadratic terms) can make necessary accommodations in many other instances. But in the case of dependent variables that are dichotomous, the linearity assumption seems especially untenable. Let us modify our example above by assuming that the outcome is a dichotomous variable coded 1 for youth who achieved independent living status and 0 for those who did not. Using regression analysis in this case, we would be modeling the probability that a youth will live independently. Because a probability must be bounded between 0 and 1, we would expect that, in cases where the expected probability of independence is already very high or very low (e.g., because of values on other independent variables in the equation), even very large changes in the value of an independent variable can generate only very modest changes in the expected probability of living independently. In other words, the effect of further changes in any independent variable would have asymptotically diminishing effects as the value of the expected probability of living independently approaches 0 or 1. This implies a violation of the linearity assumption because regression analysis makes no such provision.

Second, expected values of the outcome may be out-of-range. One could conceivably end up with predicted values on the outcome variable that exceed 1 or that are less than 0, a nonsensical result.

Third, the assumption of constant variance does not hold. The assumption that the error term in the equation has a constant variance is necessarily violated in the case of dichotomous dependent variables. Violation of this assumption is known as heteroscedasticity.

Logit Analysis: An Alternative to Regression

Fortunately, other techniques have been devised specifically for the multivariate analysis of dichotomous dependent variables. One used extensively in this volume is logit analysis. Logit analysis has been used in analyses of attendance at postsecondary educational institutions, competitive employment, independent living, general independence, and inactivity.

Logit analysis deals with the complications of nonlinearity inherent in regression analysis by transforming the outcome variable. Regression analysis models the *probability* of independent living as a function of the independent variables. Logit analysis circumvents the problems noted above by modeling the *log odds* of achieving residential independence. The log odds, often denoted Z, is defined as:

$$Z = \ln [P/(1-P)] \qquad (2)$$

where P is the probability that the outcome occurs (for example, the probability that a youth will live independently). As P approaches 1, Z approaches plus infinity and as P approaches 0, Z approaches negative infinity. In logit analysis, Z is then modeled as a linear function of the independent variables (X). Thus,

$$Z = a + b_1X_1 + b_2X_2 + e \qquad (3)$$

Using maximum likelihood methods, the estimators for the coefficients in the above equation have desirable properties. But whereas coefficients estimated from regression analysis are easily interpretable, as already described, coefficients from logit analysis lack straightforward interpretation for at least two reasons.

First, the dependent variable is a log odds. The coefficients, b_1 and b_2, represent the expected change in the log odds of the outcome for a one-unit change in the independent variables. Few people have an intuitive sense for what a change in the log odds by amount b_1 means.

Second, effects on probabilities are nonlinear. We can greatly ease interpretability by converting changes in log odds into changes in estimated probabilities. But because Z is a nonlinear transformation of the probability of an outcome, the independent variables also are nonlinearly related to P. This means that there is no single answer to the question of how changes in the value of an independent variable affect the probability of living independently. In other words, the effect of a one-unit change in an independent variable (X_1) on the probability of living independently depends on the initial value of the independent variable and on the values of all other independent variables in the equation.

One common approach to converting logit coefficients to changes in estimated probabilities, and the one followed throughout this volume, is to compute the expected values of Z when an independent variable is specified at two (or more) conceptually interesting values, while using mean values on all remaining independent variables, next to convert these Z values to probabilities, and then to take the difference between them. For dichotomous independent variables, these two alternative values obviously would be 1 and 0 (i.e., the person has the attribute in question or does not); for continuous independent variables, one value above the mean and one below the mean might be used.

For example, using equation (3) above, we would first estimate the equation to derive coefficients a, b_1 and b_2. The impact of household income, thus, represents the amount by which the log odds of living independently is expected to change for a one-unit change in household income; similarly, b_2 represents the amount by which the log odds of living independently is expected to change for youth who were minorities rather than nonminorities. To convert the effect of minority status to an impact on predicted probabilities, we might substitute mean household income for X_1, use, alternately, 0 and 1 as the values of minority status, and compute the expected value of Z for each case by multiplying through the equation. Each of these Z values could then be converted to a predicted probability of dropping out [by solving for P in equation (2) above], and they then would represent, respectively, the predicted probability of living independently for minority and nonminority youth whose households were of average income. The effect of minority status on independent living at the mean value of household income is given by the difference in these predicted probabilities.

We could evaluate the effect of household income very similarly, by substituting the mean value of minority status for X_2 (approximately .20 in our sample) and choosing alternate values of household income in turn—say, 12 and 18 (assuming income is measured in thousands of dollars). We would then solve the equation for the two values of Z and convert these two into estimated probabilities. The difference between the two probabilities would then represent the effect on the probability of living independently of changing household income from $12,000 to $18,000, at the mean value of minority status. In each of the logit analyses presented in this volume, we present the estimated change in the probabilities, calculated as noted above, and the increment of the independent variable for which the change was calculated.

Relative of Fit of Multivariate Models

An important step in multivariate analyses is the assessment of the fit of the data to the model. We evaluated the relative fit of the three sets of models to the data via the customary adjusted r^2 statistic for the total compensation models estimated through multiple regression and the pseudo r^2 statistics the logistic regression models for the remaining models. The pseudo r^2 statistic is not directly comparable to the familiar r^2 in multiple regression and does not adjust the estimate for the number of independent variables included in the model.

However, it ranges from 0 to 1 and does provide a general indicator of the overall power of the predictor variables on the dependent variables (Aldrich and Nelson, 1984).

In the main model, the independent variables of individual, community, school, school program and performance characteristics fit the data differently for the seven dependent variables. The common set of independent variables were most strongly related to attendance at postsecondary academic institutions (Table 2-4; pseudo $r^2 = .29$). They also had substantial predictive capacity in the models related to employment (pseudo $r^2 = .21$), total compensation ($r^2 = .22$), and general independence (pseudo $r^2 = .19$). They were least powerful in predicting attendance at postsecondary vocational institutions (pseudo $r^2 = .06$) and the inactive profile (pseudo $r^2 = .10$). Thus, we are most confident in our interpretations of the main models representing postsecondary academics, employment, total compensation, and overall independence inactivity, while showing a poorer fit for compensation. Within disability cluster, the distribution of predictive capacity across dependant variables was quite similar to the main model. For example, regardless of disability cluster, the models producing the best fit to the data were those representing postsecondary academics (Pseudo r^2 or $r^2 = .33$ to $.22$).

The extended models exhibited a fit to the data that was comparable to those in the main models corresponding to the same dependent variable. For example, the extended models representing total compensation yielded r^2 values ranging from .xx to .xx. The extended models regarding independent living yielded pseudo r^2 values between .xx and .xx.

Table 2-4

RELATIVE FIT OF MAIN AND CLUSTER MODELS

	Postsecondary Academics (Pseudo r^2)	Postsecondary Vocational (Pseudo r^2)	Employment (Pseudo r^2)	Total Compensation (Adjusted r^2)	Independent Living (Pseudo r^2)	Profile A or B (Pseudo r^2)	Profile E (Pseudo r^2)
Main Model	.29	.06	.21	.22	.14	.19	.10
Cluster Models							
Mild	.22	.05	.16	.16	.15	.17	.11
Physical	.33	.21	.31	.26	.25	.33	.21
Sensory	.23	.06	.10	.09	.07	.15	.10
Severe	.22	.10	.14	.07	.12	.26	.19

Limitations in Interpreting Multivariate Analysis Results

Although the multivariate analysis techniques described above are powerful analytic tools, readers should be careful to interpret the results of such analyses appropriately. Multivariate analyses identify the strength and direction of relationships between independent and dependent variables with other factors in the analyses controlled. So, for example, we can identify the influence of ethnic background on the likelihood that youth will live independently, controlling for differences in the income of the households from which minority and nonminority youth come. However, the resulting relationship should not be interpreted as cause and effect. In this example, minority status should not be interpreted as causing a lower or higher level of residential independence, but as being associated with that level of independence. This caution is essential, because it is entirely possible that the relationship is in fact caused by a third influence that is not controlled for in the analysis. Only those factors included in the multivariate analysis are controlled for statistically. Myriad unmeasured factors are also likely to be influencing postschool outcomes, as demonstrated by the amount of unexplained variation in the dependent variables that remains despite the numerous independent variables included in the analyses.

With this background information on the sample, the data, and the analytic approach in mind, we turn now to the task of describing secondary school performance of students with disabilities.

References

Aldrich, J., and Nelson, F. (1984). *Linear probability, logit, and probit models.* Beverly Hills: Sage.

Javitz, H., and Wagner, M. (1990). *The National Longitudinal Transition Study of Special Education Students: Report on sample design and limitations, wave 1 (1987).* Menlo Park, CA: SRI International.

Javitz, H., and Wagner, M. (1993). *The National Longitudinal Transition Study of Special Education Students: Sample characteristics and procedures, wave 2 (1990).* Menlo Park, CA: SRI International.

Marder, C., Habina, K., and Prince, N. (1992). *The National Longitudinal Transition Study of Special Education Students: Report on procedures for the second wave of data collection (1990).* Menlo Park, CA: SRI International.

Wagner, M., Newman, L., and Shaver, D. (1989). *The National Longitudinal Transition Study of Special Education Students: Report on procedures for the first wave of data collection (1987).* Menlo Park, CA: SRI International.

Wagner, M., D'Amico, R., Marder, C., Newman, L., and Blackorby, J. (1992). *What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R. (1991). *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

3 THE RAW INGREDIENTS: THE CONTRIBUTION OF INDIVIDUAL AND HOUSEHOLD CHARACTERISTICS TO POSTSCHOOL OUTCOMES

As individuals approach new experiences, they bring with them the composite of who they are—the raw ingredients for responding to, shaping, and interpreting those experiences. Basic human traits, such as age, gender, or ethnic background, can shape personal preferences in such important domains as employment and family formation. They also can shape how society views the individual, perhaps setting different expectations or limits for individuals with different traits. For young people with disabilities, universal traits such as gender and ethnic background are joined by aspects of disability in making up the composite of personal characteristics.

The conceptual framework of the transition process presented in Chapter 1 hypothesizes the fundamental importance of personal characteristics in shaping the school experiences of youth, as well as their outcomes in school and beyond. In the context of this transition process for youth with disabilities, we consider the influence on postschool outcomes of disability-related characteristics, individual traits, and household background. We ask such questions as: What are the effects on outcomes of youths' functional abilities? What individual characteristics affect the outcomes of adult life? Do the characteristics of youths' households of origin, known to influence their school experiences and performance, continue to influence their success in the transition to adulthood? Specifically, we consider the contribution to postschool outcomes of the following factors:

- Disability-related factors
  - Primary disability category
  - Self-care skills
  - Functional mental skills.
- Individual traits
  - Gender
  - Ethnic background
  - Parenting status.
- Household characteristics
  - Annual household income
  - One- or two-parent household
  - Parent involvement in education
  - Parent expectations for their children's futures.

The independent relationship of each of these factors to postschool outcomes is described below. Readers should be reminded that these relationships also are statistically independent of all the other factors discussed in this volume (see Table 2-3 in the preceding chapter), which are held at their mean values in calculating the influence of a particular factor.

Disability-Related Characteristics

In the analyses in this report, we consider the relationships between postschool outcomes and three aspects of disability: primary disability category, self-care skills, and functional mental skills. Although these measure important aspects of youths' abilities and disabilities, we understand that many other dimensions of their competence are unmeasured in the NLTS (e.g., IQ, self-esteem). To the extent that these unmeasured competencies influence postschool outcomes, they are rival hypotheses for explaining the relationships we demonstrate.

Primary Disability Category

The NLTS has documented the wide variation of experiences and outcomes of young people with different primary disability classifications in such important life experiences as school programs (Wagner, 1993) and school performance (Wagner, Blackorby, and Hebbeler, 1993). Earlier NLTS work also has demonstrated variations in postschool experiences by disability category (Wagner, Newman, D'Amico, Jay, Butler-Nalin, Marder, and Cox, 1991; Wagner, D'Amico, Marder, Newman, and Blackorby, 1992), which are supported by the outcomes reported in Chapter 1.

In addition to the direct relationships between disability and postschool outcomes suggested by this earlier work, we also know there to be indirect relationships between disability and outcomes through the influence of disability on other aspects of youths' experiences. For example, we know that disability influences the nature of a student's placement in school programs, thereby potentially affecting what they learn, their school performance, and ultimately the outcomes of early adult life, such as postsecondary education. Thus, our analyses include disability category, not only to determine the relationships of disability to postschool outcomes, but also to control for its interrelationships with other individual characteristics and with school program and performance factors, so that their relationships to postschool outcomes are more clear.

We assess the relationships between disability and outcomes in two ways. First, our main analyses use disability categories as independent variables to identify the independent relationships between the nature of disability and postschool outcomes. In these analyses, youth in each category must be compared to youth in a category not included in the analysis; in this case, each category of youth is compared with youth with learning disabilities.

In addition to direct relationships, we hypothesize that disability interacts with many of the other independent variables in the analyses; school experiences, for example, may benefit youth with particular disabilities more than others. Therefore, we report many findings for four subgroups of youth: those with "mild" impairments (learning disabilities, mild mental retardation, speech impairments, or emotional disturbances), sensory disabilities (hard of hearing, deaf, or visually impaired), physical disabilities (orthopedic or other health impairments), and "severe" disabilities (moderate/severe mental retardation, multiple impairments, or deaf/blindness).

Youth with learning disabilities. Table 1-1, shown earlier, demonstrates that when they had been out of school up to 3 years, 63% of youth with learning disabilities were competitively employed, an employment rate similar to those of nondisabled youth. These youth had made substantial progress toward independence and had significant wage gains in the early years out of secondary school (Wagner et al., 1992); 34% were living independently. Few of these youth, however, had enrolled in academic or vocational postsecondary education (19% and 18%, respectively). Yet these descriptive results are entangled with the variation in experiences that accompany disability classification. Nonetheless, we expect youth with learning disabilities still to excel on the dimensions of employment, residential independence, and community participation, and to continue to demonstrate low rates of postsecondary education relative to other disability categories, even when other aspects of youth and their experiences are statistically controlled.

The independent relationships between disability category and adult outcomes are depicted in Table 3-1. A negative number in Table 3-1 denotes an outcome that is worse than the outcome achieved by youth with learning disabilities. As expected, youth in most other disability categories had higher rates of enrollment in postsecondary academic programs than youth with learning disabilities, with the exception of youth with serious emotional disturbances and mental retardation. For example, youth who were hard of hearing or deaf were about 25 percentage points more likely than those with learning disabilities to have enrolled in a postsecondary academic program at some time since high school ($p<.001$). However, this pattern was reversed for vocational postsecondary education, with youth with learning disabilities being more likely to attend vocational programs than most other youth with disabilities, significantly so in the cases of youth with mental retardation and severe disabilities (24 and 20 percentage points; $p<.001$ and $p<.05$).

Independent of other factors, youth with learning disabilities were more likely than youth in all other categories to be employed when they had been out of school up to 3 years, significantly so when compared with youth with sensory, orthopedic, or severe disabilities. They also were estimated to earn between about $1,500 and $4,000 more annually than youth in other categories. Youth with learning disabilities were more likely to live independently than most other disability groups; differences were statistically significant when compared with youth with mental retardation or orthopedic or other health impairments.

The combination of residential independence and a higher employment rate made youth with learning disabilities also more likely to be characterized by profiles denoting the highest levels of community participation (A or B) and less likely to have the profile denoting low community participation (E) than most other disability groups. With the exception of postsecondary education and training, these youth appear to be succeeding on all the typical dimensions of adult life, relative to youth with other disability classifications. However, the concern that the lack of training beyond high school will eventually limit the gains of these youth, particularly in their earning power, cannot be overlooked.

Youth with serious emotional disturbances. The years following high school were difficult for youth with serious emotional disturbances. Fewer than one-fifth of them had enrolled in postsecondary education, and only about half had competitive paid jobs (Table 1-1, shown previously). Yet, for youth that did find employment, wages were high relative to youth with other disability classifications. When they had been out of school up to 3 years, 56% of youth with serious emotional disturbances had demonstrated strong participation in the community and were characterized by Profile A or B. However, 21% of youth with serious emotional disturbances were not actively participating in their communities. Further, with their high arrest rates, the rate of incarceration for these youth was also significantly higher than for their peers with other disabilities (Wagner et al., 1992).

When other aspects of individuals and their experiences were statistically controlled, we found that youth with serious emotional disturbances were less successful in all domains of adult living compared with those with learning disabilities. As shown in Table 3-1, all coefficients for youth with serious emotional disturbances are negative, showing poorer outcomes than for youth with learning disabilities, with the exception of the final factor denoting low community participation. For this factor, youth with serious emotional disturbances were estimated to be 16 percentage points more likely to have low community participation relative to youth with learning disabilities ($p<.01$). Other significant differences involved the estimated $2,204 lower annual earnings for youth with serious emotional disabilities, and the 12 percentage point lower likelihood of achieving the highest levels of community participation (Profile A or B; $p<.10$).

Youth with speech impairments. Descriptive analyses of the postschool outcomes of youth classified as speech impaired show that they did not differ greatly from their peers in the general population and were better than the average for their peers with disabilities (Marder, 1992). For example, 58% of youth with speech impairments were working when they had been out of school up to 3 years (Table 1-1, shown previously). These youth also were achieving residential independence in greater numbers than other youth with disabilities (36%). We expected multivariate analyses to show the postschool outcomes for youth with speech impairments to be quite similar to those of youth with learning disabilities.

Table 3-1

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH DISABILITY CATEGORY

	Estimated Change in:						
Disability Category	Postsecondary Academics (Percentage Points)	Postsecondary Vocational (Percentage Points)	Employment (Percentage Points)	Total Compensation (Average dollars earned)	Independent Living (Percentage Points)	Profile A or B (Percentage Points)	Profile E (Percentage Points)
Emotionally disturbed	-7.0	-9.1	-10.8	-2,204 *	-4.6	-11.5 †	15.8 **
Speech impaired	19.8 *	-5.3	-0.5	-1,495	4.9	10.3	.0
Mildly/moderately mentally retarded	-16.4 †	-24.5 ***	-8.2	-2,313 **	-14.0 *	-19.0 ***	12.8 **
Hard of hearing	24.7 ***	0.7	-10.9	-2,875 ***	-3.1	-9.6	-4.0
Deaf	25.6 ***	3.7	-22.2 **	-3,671 ***	3.4	1.1	3.2
Visually impaired	35.3 ***	-4.1	-19.6 *	-2,766 **	4.4	2.0	.2
Orthopedically impaired	12.9 †	-9.6	-25.3 **	-4,065 ***	-13.6 *	-23.7 ***	13.9 *
Other health impaired	14.2 †	-2.7	-2.3	-1,570	-12.2 †	-19.0 **	9.7
Severely impaired	3.2	-20.3 *	-17.3 †	-3,167 **	-9.9	-19.8 *	8.1

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† p<.10; * p<.05; ** p<.01; *** p<.001

Comparisons are between each disability category and youth classified as learning disabled.

Table 3-1 confirms this prediction in most respects. The exception is that youth with speech impairments were 20 percentage points more likely than youth with learning disabilities to go on to academic postsecondary programs after high school (p<.05). This higher participation in postsecondary education may bode well for the long term prospects of young people with speech impairments.

Youth with mild/moderate mental retardation. Previous NLTS research found that youth with mental retardation struggled in several respects in their transitions to adulthood. In the first 3 years after high school, 41% of these youth were employed.* However, earnings among workers were less than for youth with many other kinds of disabilities. Few youth with mental retardation had gone on to any type of postsecondary education or training, and, compared with many other youth with disabilities, a smaller percentage were gaining residential independence (15%). We expect multivariate analyses to confirm that postschool outcomes for youth with mild/moderate mental retardation were more negative than outcomes for youth with learning disabilities.

As predicted, Table 3-1 shows that youth with mild/moderate mental retardation were significantly less likely than youth with learning disabilities to achieve successful postschool outcomes in nearly all areas. They were 16 and 24 percentage points less likely to attend academic or vocational postsecondary education than youth with learning disabilities (p<.10 and p<.001), and they were estimated to make $2,313 less annually at their jobs (p<.01). They were less likely to have achieved residential independence by 14 percentage points (p<.05), less likely to be participating in two or more domains of adult life by 19 percentage points (p<.001), and 13 percentage points more likely to be inactive in their communities (p<.01).

Youth with sensory impairments. Of the various areas of adult living, youth with hearing or visual impairments were most successful regarding postsecondary education, being almost as likely as youth in the general population to attend postsecondary schools in the first 3 years after high school. In contrast, only one-fourth to 44% were employed, perhaps because of their high rate of being students. Yet, among workers, those with sensory impairments were compensated less well than youth with many other disability classifications. We expect these relationships to be borne out in multivariate analyses as well.

Table 3-1 shows that youth with sensory impairments were estimated to be 25 to 35 percentage points more likely to be enrolled in academic postsecondary programs than youth with learning disabilities (p<.001). There was no difference, however, between youth with sensory impairments and youth with learning disabilities in vocational postsecondary enrollment. As expected, the employment outcomes for youth who were sensorily impaired were weaker than those for youth with learning disabilities. Youth with sensory impairments were less likely to be employed, although the differences reached significance only for youth who were deaf or visually impaired (22% and 20%, p<.01 and p<.05). Total compensation was estimated to be significantly lower for youth with sensory impairments than for those with learning disabilities by between $2,766 and $3,671 (p<.01 and p<.001).

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* These descriptive findings are for all youth classified as mentally retarded. The multivariate models separate those with mild/moderate mental retardation from those with severe/profound mental retardation (described below). Thus, we would expect outcomes for those with milder retardation to be more positive than those reported here for the entire group.

There were no differences between youth with sensory and learning disabilities in the areas of residential independence or community participation, but the experiences that earned them similar status were different. For example, youth with sensory impairments achieved residential independence more through living in college dormitories, whereas youth with learning disabilities were more likely to be living with a spouse or roommate or alone. Similarly, youth with sensory impairments were full-time students, whereas those with learning disabilities were more likely to be full-time workers.

Youth with orthopedic impairments. Descriptive findings demonstrate that youth with orthopedic impairments were among the most likely to continue their educations and among the least likely to find employment in the early years after high school. Whereas 13% had enrolled in postsecondary vocational programs, and almost one-third had enrolled in postsecondary academic programs, only 26% of youth with orthopedic impairments were employed when interviewed, and wages were low relative to other workers with disabilities (Table 1-1). About one in six youth were living independently. Given these descriptive results, we expect multivariate analyses to confirm that youth with orthopedic impairments were more likely than youth with learning disabilities to have enrolled in academic postsecondary education programs but not in vocational programs and to have substantially less likelihood of having positive employment, residential, and participation outcomes.

Table 3-1 shows that youth with orthopedic impairments were significantly more likely to enroll in postsecondary academic education than youth with learning disabilities (13 percentage points, p<.10). The difference between the two groups in the likelihood of enrollment in vocational programs was not statistically significant. In the domain of employment and earnings, youth with orthopedic impairments fared the worst of all groups. They were 25 percentage points less likely to be employed and earned approximately $4,000 less per year than youth with learning disabilities. Youth with orthopedic impairments were 14 percentage points less likely to live independently (p<.05), 24 percentage points less likely to be participating in two or more domains of adult living (Profile A or B, p<.001)), and 14 percentage points more likely to be inactive in their communities (Profile E) than youth with learning disabilities (p<.05).

Youth with other health impairments. This category of youth was also among those that enrolled more frequently in postsecondary education programs after high school. Table 1-1 shows that there was a tendency for greater enrollment in academic than vocational programs. Only 17% had successfully made the move out of the family home, yet 65% participated in their communities on two or more dimensions up to 3 years out of school. Compared with youth with learning disabilities, the postschool outcomes for youth with other health impairments were hypothesized to be less successful, with the exception of their likelihood to have higher enrollment in academic postsecondary programs.

Table 3-1 bears out these expectations. Youth with other health impairments were 14 percentage points more likely than youth with learning disabilities to pursue academic programs (p<.10) with other factors controlled. There was no difference between the two groups in vocational training or in their employment or earnings, despite the greater fluctuations in job status of youth with other health impairments. However, as expected, these youth were less likely to be living independently (12 percentage points, p<.10), or to be participating fully in their communities (19 percentage points; p<.01) than youth with learning disabilities.

Youth with severe impairments. Compared with youth with other disabilities, the post-school outcomes of youth with severe impairments were the least successful. Only 12% of youth with multiple handicaps, for example, had gone on to postsecondary education (Table 1-1). Only 16% were competitively employed. A substantial percentage of these youth required a supervised living situation; up to 3 years after leaving school, only 8% of youth had become residentially independent and one-fourth were participating fully in their communities. We hypothesized that all of the adult living outcomes would be less successful for youth with the severest disabilities than those for the comparison group, youth with learning disabilities.

Table 3-1 shows that these youth were no less likely than youth with learning disabilities to have enrolled in a postsecondary academic program, yet they were significantly less likely to have attended vocational postsecondary education (20 percentage points, p<.05). Their employment outcomes also were negative; they were 17 percentage points less likely to be employed and earning $3,167 less annually (p<.10 and p<.01). They were less likely to live independently and significantly less likely to be fully participating in other domains of adult life, Profile A or B. However, despite being less likely to be fully participating, youth with severe impairments were not significantly more likely than those with learning disabilities to be inactive in the community, having Profile E. These youth were characterized frequently by profiles C and D, not addressed here, which captured moderate levels of community participation and involvement in supported settings, such as group homes and sheltered work environments.

Self-Care Skills

The functional limitations imposed by disability varied widely for youth within the same disability category (Marder and Cox, 1991). To understand the relationship between postschool outcomes and functional abilities, given a youth's primary disability, we have included measures of self-care and functional mental skills in the multivariate analyses.

Three types of self-care skills were included in a composite measure: the ability to dress oneself, feed oneself, and get around to places outside the home, such as to a neighbor's home or nearby park. In telephone interviews, parents were asked to report their children's ability to perform these self-care tasks completely, on their own, without help. Parents reported on a 4-point scale whether their child could do each task "very well" (4 points), "pretty well," "not very well," or "not at all well" (1 point). Values were summed to create a scale ranging from 3 (all tasks performed not at all well) to 12 (all tasks performed very well).

Youth with learning disabilities, emotional disturbances, and speech or hearing impairments had consistently high ratings on self-care skills. Greater variation in ratings existed within the disability categories of mental retardation, visual impairment, orthopedic impairments, other health impairments, and multiple handicaps. The percentage of youth with high self-care skills ratings ranged from 99% for youth with speech impairments to 54% for youth with multiple handicaps (Table 3-2). We hypothesized that, controlling for primary disability category, youth with higher self-care skills would have more positive postschool outcomes. We expected this relationship to be particularly strong for youth with physical or severe disabilities, among whom there is greater variation in self-care abilities.

Table 3-2

VARIATIONS IN SELF-CARE AND FUNCTIONAL MENTAL SKILLS SCALE SCORES, BY DISABILITY CATEGORY

	Percentage with Self-Care Scale Score of:			Percentage with Functional Mental Skills Scale Score of:			
	High	Medium	Low	High	Medium	Low	n
All conditions*	93.3 (1.4)	5.8 (1.3)	1.0 (.5)	59.9 (2.8)	35.9 (2.7)	4.3 (1.1)	1,816
Learning disabled	98.0 (1.2)	2.0 (1.2)	.0 (.0)	67.7 (4.0)	32.3 (4.0)	.0 (.0)	263
Emotionally disturbed	95.8 (2.5)	3.7 (2.4)	.5 (.9)	65.6 (6.0)	30.5 (5.8)	4.0 (2.5)	130
Speech impaired	99.2 (1.2)	0.8 (1.2)	.0 (.0)	67.7 (6.4)	29.9 (6.3)	2.4 (2.1)	116
Mentally retarded	84.9 (3.6)	12.7 (3.3)	2.4 (1.5)	40.0 (4.9)	46.4 (5.0)	13.6 (3.4)	203
Visually impaired	76.1 (4.1)	22.2 (4.0)	1.7 (1.2)	33.5 (4.7)	50.8 (5.0)	15.7 (3.6)	243
Hard of hearing	92.7 (2.6)	7.3 (2.6)	.0 (.0)	53.9 (5.0)	43.1 (5.0)	3.0 (1.7)	217
Deaf	92.4 (2.5)	7.6 (2.5)	.0 (.0)	40.0 (4.7)	59.0 (4.7)	1.0 (1.0)	253
Orthopedically impaired	63.8 (5.7)	26.4 (5.2)	9.8 (3.5)	61.6 (5.7)	34.3 (5.6)	4.1 (2.3)	166
Other health impaired	82.0 (6.0)	13.1 (5.2)	4.9 (3.3)	62.2 (7.5)	34.0 (7.3)	3.8 (3.0)	105
Multiply handicapped	54.1 (7.1)	36.5 (6.8)	9.4 (4.1)	13.2 (5.0)	50.6 (7.3)	36.3 (7.1)	108

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* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately for categories with at least 25 youth.

Interestingly, it was youth with lower self-care skills, controlling for other factors, that were more likely to attend postsecondary academic training (Table 3-3). The first column shows the difference that is estimated on each outcome for youth overall between those with high self-care skills scale scores and those with medium scores, assuming youth were the same on all other factors included in the analysis. Overall, there was an 8 percentage point lower rate of enrollment in postsecondary academic training estimated for youth with high self-care skills compared with those with medium skills (p<.10), independent of type of disability and other differences between youth. Clearly, cognitive functioning and the ability to perform in an academic environment are not necessarily related to the ability to perform basic self-care tasks. Further analysis of the disability clusters found that youth with higher self-care skills who had physical disabilities or severe impairments were significantly less likely to attend postsecondary academic training than lower-ability youth in those categories, contrary to expectations. There were 14 and 18 percentage point differences, respectively, between medium and high functioning youth in these categories in their rates of attending postsecondary academic programs (p<.10 and p<.05). These youth may have experienced

Table 3-3

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH SELF-CARE SKILLS

		Disability Type			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	-7.6 †	-8.8	4.1	-13.8 †	-17.5 *
Postsecondary vocational education (percentage points)	5.2	-25.1 *	8.4	8.1	2.2
Competitive employment (percentage points)	27.9 ***	38.1 **	13.7	29.2 **	13.7
Total compensation (average dollars earned)	1,805 **	2,540	1,832 *	1,606 **	1,304 †
Independent living (percentage points)	5.4	17.5 *	5.2	11.4	-16.1 †
Profile A or B (percentage points)	1.2	12.6	16.3	-5.8	-30.5 **
Profile E (percentage points)	-3.5	-10.6	-3.2	-1.2	-2.4

† p < .10; * p < .05; ** p < .01, *** p < .001.
Comparisons are between youth with high self-care skill scale scores and those with medium scale scores.

more success in academic endeavors than in vocational fields, where their physical limitations might have been more handicapping.

The pattern of youth with higher self-care skills being less likely to pursue postsecondary education did not hold up regarding vocational training for youth overall. However, among those with milder disabilities (mild mental retardation, learning disabilities, speech impairments, or emotional disturbances), the pattern did prevail. Youth with the highest self-care scores were 25 percentage points less likely than youth with a medium level of self-care skills to have attended postsecondary vocational programs ($p<.05$).

The explanation for lower postsecondary enrollment among higher-functioning youth may be apparent when we examine findings related to employment. We hypothesized that students with lower self-care skills would be less likely because of their physical limitations to be employed, and would earn less. Analyses confirm that youth with lower self-care skills were significantly less likely to be employed than others ($p<.001$), and they were compensated significantly less well when employed ($p<.01$). Table 3-3 shows that youth with higher self-care skills were 28 percentage points more likely to be employed than were youth with medium self-care skills. Further, we estimated that youth with higher self-care skills made $1,805 more in annual compensation than youth with a rating of medium self-care skills. The direction of relationship to employment outcomes was consistent for all disability clusters, and generally strongest for those with mild or physical disabilities.

We also hypothesized that higher self-care skills would be positively related to living independently and to greater community participation (being in Profile A or B), but negatively related to low participation (being in Profile E). However, no significant relationships were revealed for youth as a whole. Apparently, the employment advantages of higher-functioning youth were insufficient to lead to greater levels of residential independence and higher rates of full community participation for the group as a whole, independent of the effects of the type of disability youth had and other factors in the analyses.

However, the analyses by disability type revealed that failure to confirm our hypothesis resulted from self-care abilities influencing youth in opposite directions in different disability clusters. The hypothesis was supported for youth with mild disabilities. Youth with these disabilities and high self-care skills were estimated to be 18 percentage points more likely to be living independently than medium-functioning youth ($p<.05$). They also tended to be in Profile A or B at a higher rate and in Profile E at a lower rate, although not significantly so. However, assumptions regarding the positive relationship of self-care skills with independent living and being in Profile A or B were not supported by the results for youth with severe disabilities; the coefficients were negative and significant. Youth with severe impairments with higher self-care skills were 16% points less likely to be living independently and 30 percentage points less likely to be fully participating in the community than those with medium self-care skills ($p<.10$ and $p<.01$). As with the results for postsecondary academic education, it is possible for an individual with adequate cognitive capabilities to have successful adult outcomes despite very basic physical limitations. It is likely that these individuals with severe impairments were able to live independently and participate fully in other domains of adult life with support for their physical needs.

Functional Mental Skills

Included in our analyses is a composite measure of the ability to apply four basic mental skills to everyday tasks: the ability to tell time on an analog clock, read common signs, count change, and look up names in the telephone book and use the telephone. Again, parents rated their child's ability to do each task from "very well" (4 points) to "not at all well" (1 point). Values were summed to create a scale ranging from 4 (all tasks performed not at all well) to 16 (all tasks performed very well).

Even greater variability in functional mental skills existed within and between disability categories than was reported for self-care skills. The percentage of youth with high functional mental skills ranged from 68% of youth with speech impairments to 13% for youth with multiple handicaps (Table 3-2). We hypothesize that youth with higher functional mental skills would be more likely to succeed in all of the outcomes of adult living than youth with lower functional mental skills. However, we note that these abilities are correlated with several other factors included in the analyses, particularly the extent to which youth took college preparatory classes and the percentage of time they spent in regular education classrooms. Including these correlated factors may understate the effects of functional skills that would be found if other variables were not included.

No significant relationships between functional mental skills and postschool outcomes were found in the main analysis, and point estimates for all outcomes hovered near zero (Table 3-4). Apparently, most of the variation attributable to disability characteristics was explained by the nature of the disability (i.e., primary disability category), physical functioning, as measured by the self-care scale, and school program factors, not by variations in mental functioning when these other factors are controlled for. Alternatively, the functional mental skill scale may be too insensitive to differentiate the skills levels that would explain significant variations in outcomes.

However, the multivariate analyses for the disability types did show some stronger relationships. The hypothesis that higher functional mental skills would contribute to a greater likelihood of employment was supported for youth with mild disabilities. High-functioning youth with these disabilities were 12 percentage points more likely to be employed ($p<.05$) than youth with medium functional mental skills. They also were estimated to earn a total compensation that was higher by $1,861 annually ($p<.05$). Other benefits of higher functioning accrued to youth with severe disabilities, among whom higher-functioning youth were 18 percentage points more likely to live independently than youth with a medium level of functional skills ($p<.05$).

Table 3-4

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH FUNCTIONAL MENTAL SKILLS

	All Youth	Disability Type			
		Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	4.1	2.2	-.5	2.0	-3.4
Postsecondary vocational education (percentage points)	-1.4	1.4	.5	-32.0 **	10.0
Competitive employment (percentage points)	.3	12.3 *	-2.5	-29.1 *	6.2
Total compensation (average dollars earned)	124	1,861 *	-444	-848	-34
Independent living (percentage points)	1.3	-5.2	0.0	-6.9	17.9 *
Profile A or B (percentage points)	-.6	1.7	-2.4	-25.7 †	11.4
Profile E (percentage points)	2.7	-0.7	1.5	18.3 *	-4.7

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† p<.10; * p<.05; ** p<.01.

Comparisons are between youth with high functional mental skills scale scores and those with medium scores.

In contrast, findings for youth with physical disabilities with higher functional mental skills were contrary to expectations and difficult to interpret. Among these youth, those with the highest skills were less likely to be employed by 29 percentage points (p<.05) and less likely to be in vocational programs by 32 percentage points (p<.01) than their peers with physical disabilities who had medium functional skills. Youth with physical disabilities with higher functional mental skills also were less likely to be in Profile A or B by 26 percentage points (p<.10) and more likely to be in Profile E by 18 percentage points (p<.05). These are stronger relationships for youth with physical disabilities than were found between outcomes and self-care skills, which were expected to capture the variation attributable to differences in physical functioning. There were no significant trends for youth with sensory or severe impairments regarding functional mental skills.

Individual Demographic Characteristics

Much education and social science research has demonstrated the powerful influences that demographic and household characteristics can have on young people as they enter adulthood. In this section we examine the relationship to postschool outcomes of several individual demographic characteristics, including gender, ethnic background, and parenting status.

Gender

Although the general population consists of approximately equal numbers of males and females, among young people with disabilities, males outnumbered females by about 2 to 1. Males made up the majority in every disability category except deaf/blind, and the ratio of males to females was exceptionally high—about 3 to 1—among youth classified as learning disabled or emotionally disturbed. A notably high percentage of youth classified as multiply handicapped also were male (65%). Thus, multivariate analyses are needed to disentangle the relationships between gender and postschool outcomes, independent of disability.

Much research on young adults in the general population emphasizes the marked differences between young men and young women in many life domains. For example, males and females generally have markedly different employment patterns over the life cycle, and work in different kinds of jobs at very different wages (e.g., Greenberger and Steinberg, 1983) In 1989, 72% of women in the general population aged 20 to 24 were in the labor force, compared with an employment rate of 85% for males (Office of Educational Research and Improvement, 1991). Through the mid 1970s, women in the general population were consistently less likely than men to attend postsecondary schools; only fairly recently has the postsecondary school attendance of young women equaled that of young men, so that by 1987, 24% of 18- to 21-year-old males and 22% of 18- to 21-year-old females were enrolled in institutions of higher education (National Center for Education Statistics, 1992).

From the experiences of youth in the general population, we would expect significant gender differences in some outcomes for youth with disabilities. Reflecting experiences of the general population of youth, rates of employment, particularly, are expected to be higher for young men than for women, while rates of postsecondary school attendance are hypothesized to be unrelated to gender. Because of higher rates of marriage among young women (Wagner 1992), we also expect residential independence to be higher for them.

As presented in Table 3-5, the relationship of gender to postschool outcomes for youth with disabilities is fairly consistent with the experiences of their peers in the general population, with a few exceptions. NLTS analyses indicate no significant difference in postsecondary school attendance in either academic or vocational programs by gender for young adults with disabilities. Further, the expected difference in employment rates for young men and women with disabilities is not found when factors such as parenthood are controlled for in these multivariate analyses. However, although employment rates did not differ, NLTS analyses found significant differences in the compensation earned by working men and women with disabilities. Young men with disabilities were estimated to earn $1,814 per year more than young women (p<.001), independent of other factors. This difference resulted from the significantly higher compensation earned by young men with mild and sensory disabilities relative to women with those disabilities.

Table 3-5

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH GENDER

		Disability Type			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	.9	-.1	-1.6	9.1	7.9
Postsecondary vocational education (percentage points)	-1.7	-1.0	.2	-1.8	-.6
Competitive employment (percentage points)	5.2	-1.3	5.1	10.5	7.7
Total compensation (average dollars earned)	1,814 ***	2,603 ***	1,188 *	705	747
Independent living (percentage points)	-6.4 *	-1.8	-3.6	-14.8 †	-9.5
Profile A or B (percentage points)	4.7	16.5 **	.2	6.3	-17.4
Profile E (percentage points)	1.7	-1.8	4.4	-8.0	9.8

† p<.10; * p<.05; ** p<.01; *** p<.001

Comparisons are between males and females.

Although young men with disabilities tended to earn more money than their female counterparts, males were significantly less likely to be living independently. Young men were 6 percentage points less likely than young women with disabilities to live independently overall (p<.05) and among youth with each cluster of disabilities, although only among youth with physical impairments was the difference statistically significant (15 percentage points, p<.10). Gender differences in independent living probably were due in large part to gender differences in marriage rates. Females were twice as likely as males to be married or living with a person of the opposite sex when they had been out of school up to 2 years (30% vs. 15%; Wagner, 1992). Earlier NLTS analysis showed a strong relationship between marriage and living independently (Newman, 1991a).

Gender did not appear to be related to community participation as measured by having either Profiles A or B or Profile E except for those with mild disabilities. Young men with learning, emotional, or speech disabilities or mild mental retardation were 16 percentage points more likely to be fully participating in the community than were their female peers (p<.01). This difference may result from the fact that young women were marginally more severely impaired than young men in the same disability categories, perhaps in ways not measured in these analyses, ways that may have made a greater difference in the overall levels of community participation among mildly impaired youth (Wagner, 1992).

Ethnic Background

Almost two-thirds of young adults with disabilities were white, 24% were African American, 8% were Hispanic, and 3% were reported to belong to other ethnic groups, including Asian, Pacific Islander, American Indian, or Alaskan native (Marder and Cox, 1991). The percentage of young adults with disabilities who were African American was higher than the corresponding percentage in the general population (14%, National Center for Education Statistics, 1987). Each disability category contained a higher percentage of African American youth than did the general population of youth, with few significant variations in ethnic distribution between disability categories. The only exceptions were significantly lower percentages of students who were white in the speech impaired and other health impaired categories (Marder and Cox, 1991).

From the experiences of youth in the general population, we would hypothesize that African American and Hispanic youth with disabilities would experience more problematic postschool outcomes than their white peers. For example, African American and Hispanic youth in the general population were significantly less likely to continue on to postsecondary education. In 1990, more than one-third (35%) of all white 18- to 24-year-olds were enrolled in institutions of higher education, compared with only one-quarter of those who were African American and 16% of those who were Hispanic (National Center for Education Statistics, 1992). African American youth in the general population also were more likely to be unemployed than white youth. In 1989, about 18% of African American male youth were unemployed, compared with 10% of Hispanics and 8% of whites (Office of Educational Research and Improvement, 1991).

NLTS analysis, presented in Table 3-6, indicates a pattern of significantly more negative postschool outcomes for African American youth. They were estimated to be almost 13 percentage points less likely to be employed (p<.05), and those who were employed were estimated to earn $1,017 less each year (p<.10). They were 8 percentage points less likely to be living independently (p<.10), almost 11 percentage points less likely to be fully participating in the community (in Profiles A or B, p<.05), but more than 9 percentage points more likely to have low community participation (Profile E, p<.01). These relationships were fairly consistent across the disability cluster models, although not always statistically significant. The exception to a pattern of more negative outcomes for African American youth involved postsecondary enrollment. When controlling for other factors, African American youth with disabilities were as likely as their white peers to continue on to both academic and vocational postsecondary programs. Only in the case of African American youth with physical impairments was the postsecondary attendance rate consistently lower, significantly so for enrollment in academic programs.

Hispanic young adults with disabilities showed a less consistent pattern of postschool outcomes when compared with their white peers. They were estimated to be 11 percentage points more likely than white youth to have attended a postsecondary vocational school, independent of other differences between them (p<.10). This higher rate of postsecondary enrollment is the opposite of their experiences during secondary school. Earlier NLTS bivariate analyses revealed that fewer vocational training opportunities and experiences were available to Hispanic than to white students with disabilities in high school. Secondary schools attended by Hispanic youth were less likely to offer specific job skills training to those classified as special education students. Hispanic students with disabilities were more likely than their black and white peers not to have received vocational services, such as vocational education, job skills training, prevocational skills training, career counseling, job placement, or other job-related services (Newman, 1992). In spite of, or possibly because of, these experiences, Hispanic youth were more likely to have continued on to postsecondary vocational training.

Although there was no significant difference between Hispanic and white youth regarding employment for the groups as a whole, differences were observed for youth with physical impairments. Hispanic youth with physical disabilities were significantly more likely to be employed (50 percentage points; p<.01) and to earn more money ($3,054, p<.01) than their white peers with physical disabilities.

Hispanic young adults with disabilities were significantly less likely than white youth to be living independently; they were almost 19 percentage points less likely than their white peers to be living on their own (p<.001). Consistent with this, they also were less likely to be participating fully in the community; Hispanic youth were almost 17 percentage points less likely than their white peers to be categorized as a Profile A or B (p<.01). This pattern of

Table 3-6

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH ETHNIC BACKGROUND

		Disability Type			
	All Youth	Mild	Sensory	Physical	Severe
Youth was African American					
Postsecondary academic education (percentage points)	2.2	1.8 *	6.7	-26.6 †	-8.3
Postsecondary vocational education (percentage points)	-.5	-.3	.8	-9.2	4.1
Competitive employment (percentage points)	-12.6 *	-13.0 †	-14.6 *	17.9	-2.9
Total compensation (average dollars earned)	-1,017 †	-1,680 †	-1,020	1,373	-385
Independent living (percentage points)	-8.0 †	-5.4	-6.7	1.9	--
Profile A or B (percentage points)	-10.7 *	-11.6	-9.1	-29.2 †	3.7
Profile E (percentage points)	9.1 **	8.0	10.8 *	8.7	2.5
Youth was Hispanic					
Postsecondary academic education (percentage points)	1.6	-4.8	-1.2	2.3	-11.8
Postsecondary vocational education (percentage points)	11.1 †	1.3	9.4	-7.8	13.5
Competitive employment (percentage points)	-.5	-11.7	.2	50.3 **	5.0
Total compensation (average dollars earned)	-23	-1,661	-440	3,054 **	1,310
Independent living (percentage points)	-18.6 ***	-12.5	-21.3 *	-9.4	--
Profile A or B (percentage points)	-16.7 **	-17.2 †	-10.3	-36.2 *	-17.3
Profile E (percentage points)	5.9	12.1	5.4	3.5	2.5

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† p<.10; * p<.05; ** p<.01; *** p<.001; --=too few cases to analyze

Comparisons in the top half of the table are between African American and white youth. Those in the bottom half of the table are between Hispanic and white youth.

relationships was consistent across the disability clusters, perhaps due to cultural differences between Hispanic and other youth regarding family living arrangements and family formation.

Parenting Status

Parenthood was significantly more common among females than males with disabilities. Further, young women with disabilities were significantly more likely to be mothers than were females in the general population who had been out of secondary school a similar length of time. When young women with disabilities had been out of school 3 to 5 years, 41% were mothers, compared with 28% in the general population of young women (Wagner, 1992). Only 16% of men with disabilities were reported to be fathers. One in five single women with disabilities were mothers, a significantly higher incidence of single-motherhood than among young women in the general population.

The frequency with which young adults with disabilities, especially young women, were parents in their early years after leaving school could have implications for many other aspects of their lives. With the added demands of parenthood, we would expect parents to be less likely to attend postsecondary schools. Being a parent, especially being a mother, also could affect employment prospects. Although young mothers in the general population are more likely to be in the workforce than were mothers in previous generations, more than half of all young mothers do not work outside the home (Bureau of Labor Statistics, 1993). Those that do work are paid less well than men. We hypothesized that, similar to their peers in the general population, young mothers with disabilities were less likely to be employed and, if they were employed, likely to be paid less well than nonmothers. We also expected that parenthood would have a greater impact on the employment experiences of mothers compared with fathers. Earlier NLTS findings indicated that among young women with disabilities who were not working outside the home and were not looking for work, 42% reported that raising children and household responsibilities were reasons for not seeking employment; only 2% of young men who were not looking for work reported family responsibilities as a reason for not seeking employment (D'Amico and Blackorby, 1992).

As presented in Table 3-7, being a parent, especially being a mother, was negatively related to several postschool outcomes. Negative effects were consistent for both mothers and fathers regarding postsecondary academic education. Mothers were 19 percentage points ($p<.01$) and fathers were 26 percentage points ($p<.01$) less likely than their nonparenting peers to have attended a postsecondary academic program. However, a negative effect on employment was noted only for mothers. Young women with disabilities who were mothers were significantly less likely to be employed (36 percentage points; $p<.001$), and they earned significantly less ($1,940 less per year, $p<.05$) than nonparenting young women. The employment experiences of young fathers did not appear to be significantly affected by their parenting demands.

The one dimension on which young parents with disabilities had more positive outcomes than their nonparenting peers was living independently. Both fathers and mothers were more likely to be living independently than were their nonparenting peers (mothers were 34 percentage points and fathers 31 percentage points more likely to be living independently, p<.001). This difference in living independently is probably related to the difference in marriage rates for parents and nonparents; parents were more likely to be married or living with someone of the opposite sex, and therefore living with a spouse or roommate.

Because of insufficient sample size and variation on the parenting variable in the models focusing on youth with specific types of disabilities, parenting status was included only for mothers and only for some outcomes. Generally, the relationship of being a mother to postschool outcomes for subgroups of youth was similar to the pattern for all youth with

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Table 3-7

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH PARENTING STATUS

	All Youth		Disability Type (Mothers only)			
	Youth Was a Father	Youth Was a Mother	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	-25.8 **	-19.1 **	--	-28.6 *	55.2 *	18.5
Postsecondary vocational education (percentage points)	1.4	-10.5	-10.7	-.8	--	--
Competitive employment (percentage points)	-1.9	-35.5 ***	-49.0 ***	-11.0	--	--
Total compensation (average dollars earned)	818	-1,940 *	-3,079 †	72	-4,276	-241
Independent living (percentage points)	31.1 ***	33.7 ***	55.7 ***	17.8	--	6.2
Profile A or B (percentage points)	3.3	8.9	18.3 †	-3.4	32.4	6.6
Profile E (percentage points)	.1	6.5	-1.9	11.7	21.3	29.4

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† p<.10; * p<.05; ** p<.01; *** p<.001; --=too few cases to analyze

Comparisons in the first two columns are between father and males who were not fathers and between mothers and females who were not mothers. Comparisons for disability types were between mothers and those without children.

disabilities. The only significant exception was for youth with physical disabilities. For this group of young adults, mothers appeared to be more likely to be enrolled in postsecondary academic programs than were those without children, contrary to expectations.

Household Characteristics

Here we shift our focus from the characteristics and experiences of youth themselves to characteristics of their parents' or guardians' household, focusing on two socioeconomic measures: the number of parents in the household, and household income. We then consider the parents or guardians and their involvement in their children's educations and their expectations for their children's accomplishments as young adults.

Economic Disadvantage

Youth with disabilities were significantly more likely than youth as a whole to be from households with lower incomes. The annual household income was less than $12,000 in 1986 for 35% of youth with disabilities and less than $25,000 for 68% (Marder and Cox, 1991). Comparable figures for the general population of youth indicate that 18% were in households with incomes of less than $12,500 and 39% were in households with less than $25,000 (U. S. Bureau of the Census, 1988). Whereas 36% of the general population of youth were in households with annual incomes of $40,000 or more, only 15% of youth with disabilities were in households with incomes of $38,000 or more.

In 1987, more than one-third of youth with disabilities lived in a household with only one parent. They were more likely to be from single-parent households (37%) than were youth in the general population (26%; Marder and Cox, 1991). In the population of youth with disabilities, strong links exist among household characteristics; 57% of youth who came from single-parent households also came from households with annual incomes of under $12,000. Both household income and coming from a single-parent household were measured in 1987, during the first parent interview, when most of the youth in the NLTS sample were students and still living in their parents' or guardians' households. Because for many youth, postschool outcomes were measured 3 years later, the explanatory power of these factors might be diminished by the extent to which they changed during those years.

Research has documented the negative effects of poverty on the transition experiences of adolescents and young adults. Income can affect the educational resources and experiences to which a youth has access (Jencks et al., 1972). It is a common risk factor for poor school performance in the general population (Kaufman and Bradby, 1992; Eckstrom, Goertz, Pollack, and Rock; 1989). It continues to be a risk factor after school; for example, socioeconomic status has been found to be positively associated with postsecondary enrollment for youth in the general population (Alexander, et al., 1978; Corazzini et al., 1972;

Stage and Hossler, 1989). Although the relationship between family background and successful transition from school to adult life is well documented, the explanation for the association is not clear. Whether because of differing expectations, values, school experiences, parental efforts, or the self-family-friend network, we hypothesize that young people from economically disadvantaged families—those from single-parent households and poorer families—will demonstrate less positive transition outcomes.

Consistent with our hypothesis, youth from poorer families were significantly less likely to attend postsecondary education programs, particularly academic programs (Table 3-8), independent of other factors. They were 9 percentage points less likely than their wealthier peers to attend an academic postsecondary program ($p<.001$) and 5 percentage points less likely to attend a vocational postsecondary program ($p<.10$). These relationships are consistent in direction across all disability groups, but statistically significant only for enrollment in academic programs for youth with mild or sensory impairments.

Controlling for other factors, economically disadvantaged youth were not less likely than others to be employed for the group as a whole. However, there is a negative association between household income and employment for youth with physical or severe impairments (13 percentage points; $p<.10$). Poorer youth as a group earned $760 less per year than did those from wealthier families; compensation gaps were even larger for youth with mild, physical, or severe impairments ($p<.10$ to $p<.01$).

Youth from poorer families were significantly less likely to be fully participating in the community (in Profile A or B, 6 percentage points; $p<.05$) and significantly more likely to be categorized as the least participatory, Profile E (5 percentage points; $p<.05$). The negative effects of poverty were particularly strong for youth with sensory impairments, who were 16 percentage points less likely to be fully participating in the community ($p<.001$) and 11 percentage points more likely to demonstrate low participation ($p<.01$). Strong effects also are noted for poor youth with severe impairments, who were 22 percentage points more likely than wealthier peers with the same disabilities to be inactive in their communities ($p<.05$).

With household income and ethnic background controlled for in the analyses, coming from a single-parent family showed few consistent significant relationships with postschool outcomes, with the exception of enrollment in postsecondary academic programs. Youth from single-parent households were 9 percentage points more likely to attend an academic postsecondary program ($p<.05$) than youth from two-parent households, independent of household income and other factors included in the analysis.

The relationships between household income and coming from a single-parent family to postschool outcomes is fairly consistent across the disability groups and is similar to the relationship seen for youth with disabilities overall. Coming from a poorer family affected almost all spheres of the adult lives of youth in each of the disability clusters. In contrast, as experienced by youth with disabilities overall, coming from a family with only one parent

Table 3-8

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH ECONOMIC DISADVANTAGE AND SINGLE-PARENT HOUSEHOLDS

		Disability			
	All Youth	Mild	Sensory	Physical	Severe
Influence of low income on:					
Postsecondary academic education (percentage points)	-9.3 ***	-7.4 *	-13.1 **	-11.6	-5.0
Postsecondary vocational education (percentage points)	-5.3 †	-3.4	-5.0	-1.5	-2.0
Competitive employment (percentage points)	-2.9	-.2	-3.3	-13.4 †	-13.1 †
Total compensation (average dollars earned)	-760 *	-1,144 *	-379	-1,103 †	-1,548 **
Independent living (percentage points)	-1.3	-.1	-1.8	2.5	-5.1
Profile A or B (percentage points)	-6.1 *	-.3	-16.4 ***	5.9	-12.5
Profile E (percentage points)	5.2 *	3.8	10.9 **	-2.0	21.7 *
Influence of single-parent household on:					
Postsecondary academic education (percentage points)	9.1 *	11.6 †	7.4	7.7	-2.3
Postsecondary vocational education (percentage points)	3.2	-3.6	6.2	-12.7	4.6
Competitive employment (percentage points)	-6.8	-4.8	3.2	-7.4	9.3
Total compensation (average dollars earned)	-457	615	-36	-719	1,468 †
Independent living (percentage points)	1.3	-5.2	4.5	3.1	7.4
Profile A or B (percentage points)	-.2	3.6	3.7	-27.0 *	2.0
Profile E (percentage points)	.2	-.8	-4.1	18.4	-12.0

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† p<.10; * p<.05; ** p<.01; *** p<.001

Comparisons regarding household income are between those with incomes of less than $12,000 and those with incomes between $38,000 and $50,000. Comparisons for household composition are between those from single-parent and those from two-parent households.

seemed to have few significant negative relationships to postschool outcomes when other factors are controlled. One exception is that youth with physical impairments from single-parent households were 27 percentage points less likely to be participating fully in their communities than peers with similar disabilities from two-parent households ($p<.05$). Contrary to expectations, youth from single-parent households earned marginally more than those from two-parent households among youth who had severe impairments.

Parent Involvement

Families differ not only in their composition and income, but also in the degree to which parents are involved with their children and support their positive development. One indicator of this positive parenting is the level of parental involvement in the educational process. Further, one could expect that parents who were actively involved in their children's educations would continue that active support of their children through their transition years.

Parents can be involved in their children's education in many ways, including activities at home, and formal parent-school interactions, such as attending parent-teacher conferences, as well as less formal school involvement, such as attending school performances. Numerous studies have found parent support for education to be an important factor in their children's educational success (e.g., Epstein, 1985; Young, 1993; Ferhmann, Keith, and Reimers, 1987; Liebowitz, 1977; Rumberger et al., 1988). Although parent involvement is important for all students, for students with disabilities its importance "cannot be overestimated" (Bennett, 1988). Parents of children with disabilities "must be active, skillful advocates capable of devoting a large amount of time to safeguarding their child's education" (Heumann, 1993). Once children with disabilities leave the school, there is often still a need for parental advocacy and oversight (Nisbet, Covert, and Schuh, 1992).

To measure parental involvement in the education process, teachers of a subset of 12th-grade students were asked to report "how involved have this student's parents been in his/her secondary school experiences (e.g., helping with homework, monitoring student's progress in school)?" Teachers responded using a 4 category scale, ranging from "not at all involved" to "very involved." Fewer than one-fourth of 12th-graders with disabilities had parents whom teachers described as very involved in their school experiences (23%). However, fewer than 1 in 10 had parents who were described as "not at all involved" (9%) (Wagner, Blackorby, and Hebbeler, 1993).

Although secondary school teachers may not have a complete or fully accurate picture of parental involvement, earlier NLTS research found a powerful relationship between school performance and this measure of parental support for their children's education. When controlling for all other factors, students whose teachers indicated that their parents were very involved in their education missed 5 fewer days of school ($p<.05$), and were 25 percentage points less likely to fail a class ($p<.001$) than their peers whose parents were not at all involved (Wagner, Blackorby, and Hebbeler, 1993). We hypothesized that parent involvement would continue to have a positive influence on a young adult's life after secondary school, and would expect parent involvement to be positively related to postschool outcomes.

As presented in Table 3-9, parent support for education is positively related to several postschool outcomes. It is significantly related to postsecondary attendance in a vocational program and to low community participation. Controlling for other factors, young adults whose parents had been very involved in their educations were almost 21 percentage points more likely than their peers whose parents were not at all involved to have enrolled in a postsecondary vocational program (p<.01). Those with very involved parents also were significantly less likely to have low community participation, Profile E (39 percentage points, p<.01).

Table 3-9

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH PARENT INVOLVEMENT

	Parent Involvement in Students' Secondary School Experiences
Postsecondary academic education (percentage points)	10.6
Postsecondary vocational education (percentage points)	20.9 **
Competitive employment (percentage points)	18.5
Total compensation (average dollars earned)	-1,085 ***
Independent living (percentage points)	2.5 *
Profile A or B (percentage points)	.1
Profile E (percentage points)	-38.9 **

† p < .10; * p < .05; ** p < .01; *** p < .001

Comparisons are between youth whose parents were "very involved" and those whose parents were "not at all involved."

As a measure of involvement in schooling, it is not surprising that parent support for education has a stronger relationship to school performance measures, such as absenteeism and course failure, than to postschool outcomes. Yet, clearly, parent involvement continues to have an impact, even after students leave secondary school, suggesting that this variable is acting as a proxy for parent involvement in postschool issues, since it is probable that parents who were involved in their children's schooling often would continue to be involved in their children's lives once they leave secondary school.

Parent Expectations

In addition to the amount and type of active parent support for and involvement in education, families also differed in the aspirations and expectations they held for their children. To measure family expectations, in 1987 parents were asked to speculate about their children's futures by reporting their perceptions of the likelihood that their children would attain specific goals, such as attending a postsecondary school, being competitively employed, and living independently. For each goal they reported whether they thought their child "definitely would," "probably would," "probably wouldn't," or "definitely wouldn't" achieve the goal. In these analyses, "definitely would" and "probably would" denote a positive expectation, which is contrasted in a dichotomous variable with parents reporting either "probably wouldn't" or "definitely wouldn't."

Parent expectations for the future were influenced by characteristics of both the child and the family. Parents' expectations were strongly influenced by their child's disability category, as well as their child's functional abilities. As presented in Table 3-10, there were significant differences in expectations for youth with different disabilities. For example, while virtually all youth with learning disabilities (96%) were expected by their parents to live independently in the future, only one-third of those with multiple impairments were expected to do so.

Earlier NLTS analysis found a systematic relationship between self-care skills and parental expectations. For example, only 3% of youth who scored low on the self-care scale were expected to live away from home unsupervised. Conversely, 84% of youth with high scores on the self-care skills scale and 92% of youth with high scores on the functional mental skills scale were expected to achieve residential independence (Newman, 1991b).

We hypothesized that, even controlling for confounding factors, such as family income, disability category, and functional skills, high parent expectations would be related to positive postschool outcomes. Parental expectations are related to the general values and culture of the family, and are seen as strong motivators of attainment (Marjoribanks, 1983). A number of studies have found direct effects of parental expectations on postschool outcomes. For example, several researchers have found parental expectations to be related to the likelihood of a student's attending a postsecondary school (Carpenter and Fleishman, 1987; Conklin and Dailey, 1981; Ekstrom, 1985; Gilmour et al., 1978; Hossler and Stage, 1988, Murphy, 1981). One reviewer of postsecondary education attainment literature found that "an attitude of indifference or discouragement on the part of parents regarding going to college is extremely difficult for a student to overcome" (Beezer and Hjelm, 1961).

Table 3-10

PARENT EXPECTATIONS, BY DISABILITY CATEGORY

		All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Visually Impaired	Hard of Hearing	Deaf	Orthopedically Impaired	Other Health Impaired	Multiply Handicapped
Youth reported by parent as likely to:												
Attend a post secondary school		55.1	55.3	43.8	64.0	22.1	73.0	67.3	65.9	63.7	58.2	16.3
		(1.5)	(3.9)	(5.6)	(5.6)	(3.8)	(3.6)	(4.1)	(3.8)	(4.8)	(6.2)	(4.7)
	n	1,734	253	121	114	190	233	208	246	157	98	98
Be employed		94.1	100.0	99.2	97.5	88.1	94.1	99.1	95.7	87.7	94.1	79.0
		(.7)	(.0)	(1.0)	(1.8)	(2.9)	(1.9)	(.8)	(1.6)	(3.3)	(2.9)	(5.1)
	n	1,781	265	128	119	193	236	215	253	155	101	100
Live independently		76.9	96.5	85.4	85.8	61.5	79.0	86.9	84.0	62.0	67.7	33.3
		(1.3)	(1.4)	(4.0)	(4.1)	(4.4)	(3.4)	(2.9)	(2.9)	(5.0)	(5.9)	(5.9)
	n	1,720	256	123	113	187	229	206	243	150	99	99
Number of outcomes youth expected to attain												
All 3 outcomes		46.3	51.3	38.0	54.2	18.9	61.3	57.2	58.3	44.0	42.7	11.9
		(1.5)	(3.8)	(5.3)	(5.7)	(3.5)	(3.9)	(4.2)	(3.9)	(4.9)	(6.1)	(4.0)
2 outcomes		32.7	41.9	45.7	32.5	41.8	22.1	33.5	25.6	30.2	34.0	23.8
		(1.4)	(3.8)	(5.5)	(5.3)	(4.4)	(3.3)	(4.0)	(3.4)	(4.6)	(5.8)	(5.3)
1 outcomes		15.2	6.4	15.5	10.8	26.5	10.8	8.8	13.4	14.5	16.5	43.6
		(1.1)	(1.9)	(4.0)	(3.5)	(3.9)	(2.5)	(2.4)	(2.7)	(3.5)	(4.6)	(6.2)
No outcomes		5.7	.4	.8	2.5	12.8	5.8	.5	2.8	11.3	6.8	20.8
		(.7)	(.5)	(1.0)	(1.8)	(3.0)	(1.9)	(.6)	(1.3)	(3.1)	(3.1)	(5.0)
	n	1,800	267	129	120	196	240	215	254	159	103	101

Standard errors are in parentheses.

- "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 students.

Source: Parent interviews.

As presented in Table 3-11, consistent with our hypothesis, parent expectations were highly related to several postschool outcomes, including postsecondary attendance, independent living, and community participation. Controlling for other factors, young adults whose parents had expected them to continue on to postsecondary school were 33 percentage points more likely to attend a postsecondary academic program ($p<.001$) and 8 percentage points more likely to attend a postsecondary vocational program ($p<.05$) than youth who were not expected to do so. These relationships were consistent and strong across disability groups. Attendance at a postsecondary academic program for youth with severe disabilities was particularly strongly influenced by parent expectations that youth would do so (56 percentage points; $p<.001$). Similarly, youth who were expected eventually to live independently were almost 13 percentage points more likely to do so ($p<.05$), with even stronger associations noted for youth with mild or severe impairments (22 to 26 percentage points difference; $p<.05$). In contrast, employment outcomes were not related to parental expectations for any disability group.

Because community participation involves many aspects of life, we compared status on this factor with the sum of parents' expectations for the three postschool outcomes of postsecondary school attendance, employment, and independent living. Youth whose parents expected them to achieve positive outcomes on all three dimensions were 34 percentage points more likely to be fully participating in their communities (Profile A or B; $p<.001$) and almost 12 percentage points less likely to have low participation (Profile E; $p<.05$) than were those who were not expected to attend postsecondary school, become employed, or live independently. This pattern of strong positive relationships between parent expectations for the future and postschool outcomes remained consistent across youth in the different disability clusters.

This chapter has presented the results of multivariate analyses investigating the independent effects of the individual and household characteristics that youth brought to the process of attaining some of the expected roles of adult life. We find that disability—both its type and its severity—had powerful influences on many aspects of the postschool experiences of young adults with disabilities. Gender, ethnic background, and economic disadvantage also helped shape several of the outcomes that youth experienced. Given the strong relationships of these fixed or immutable characteristics of youth, it is tempting for educators, or even parents, to determine that there is little they can do to support youth with disabilities in achieving greater success in school and beyond.

Table 3-11

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH PARENTAL EXPECTATIONS

		Disability Type			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)					
Parent expected youth to attend postsecondary school	33.0 ***	22.5 ***	39.6 **	37.0 **	56.5 ***
Postsecondary vocational training (percentage points)					
Parent expected youth to attend postsecondary school	8.3 *	-.3	11.1 *	21.0 **	11.0
Competitive employment (percentage points)					
Parent expected youth to be competitively employed	-6.8	-	-11.4	20.4	-10.7
Total compensation (average dollars earned)					
Parent expected youth to be competitively employed	-942	890	-2,065	1,729	-1,219
Independent living (percentage points)					
Parent expected youth to live independently	12.6 *	22.2 *	5.3	.1	25.5 *
Profile A or B (percentage points)					
Parent expected youth to attend postsecondary school, be competitively employed and achieve an independent living arrangement	34.0 ***	29.1 *	24.8 †	69.8 **	54.8 **
Profile E (percentage points)					
Parent expected youth to attend postsecondary school, be competitively employed and achieve an independent living arrangement	-11.8 *	-15.7	-7.5	-19.6	-17.7

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† p<.10; * p<.05; ** p<.01; *** p<.001.

Comparisons are between youth with parents with positive expectations (youth would achieve specified goal) and those with parents with negative expectations (youth would not achieve goal).

The findings in this chapter offer a strong counter argument to whatever dismay parents might feel regarding their role in facilitating the transition of their children with disabilities to adulthood. Given youth who were similar in their type of disability and their level of self-care and mental functioning, parents who expected more success for their children were rewarded with greater success in the areas of postsecondary education, independent living, and community participation. Similarly, controlling for other aspects of disability, demographics, and family resources, parents who were more involved in their children's educations in secondary school were more likely to see their children go on to further education. Perhaps it is parental involvement and expectations that directly contribute to these positive outcomes. Alternatively, these factors may be indicators of parents who actively work in many other ways as well to advocate for their children, provide positive experiences for their children, offer opportunities for responsibility and achievement for their children, and so forth. Together, these aspects of parenting may help explain the relatively greater success of youth with disabilities whose parents expected more of them and were actively involved in their educations through secondary school. The influence of these aspects of parenting was powerful, more so than most of the other factors we have examined.

References

Alexander, K. L., D'Amico, R. J., Fennessey, J., and McDill, E. L. (1978). *Status composition and educational goals: An attempt at clarification.* Washington, DC: National Institute of Education.

Beezer, R. H., and Hjelm, H. F. (1961). *Factors related to college attendance.* U.S. Office of Education, Cooperative Research Monograph No. 8.

Bennett, W. (1988). Parents key to educating handicapped children. *Education Daily* . March 31, 1988.

Bureau of Labor Statistics. (1993). Unpublished March 1993 population survey. Washington, DC.

Carpenter, P. G., and Fleishman, J. A. (1987). Linking intentions and behavior: Australian students' college plans and college attendance. *American Educational Research Journal, 24*(1), 79-105.

Conklin, M. E., and Dailey, A. R. (1981). Does consistency of parental encouragement matter for secondary students? *Sociology of Education, 54*, 254-262.

Corazzini, A. J., Dugan, D. J., and Grabowski, H. G. (1972). Determinants and distributional aspects of enrollment in U.S. higher education. *Journal of Human Resources*, *7*, 39-59.

D'Amico, R., and Blackorby, J. (1992). Trends in employment among out-of-school youth with disabilities. In Wagner, M., D'Amico, R., Marder, C., Newman, L., and Blackorby, J., *What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Eckstrom, R., Goertz, M. E., Pollack, J. M., and Rock, D. A. (1980). Who drops out of high school and why? Findings from a national study. In Natriello, G. (Ed.), *School dropouts: Patterns and policies.* New York: Teachers College Press.

Ekstrom, R. B. (1985). *A descriptive study of public high school guidance: Report to the Commission for the Study of Precollegiate Guidance and Counseling.* Princeton, NJ: Educational Testing Service.

Epstein, J. L. (1985). *Parent involvement: What research says to administrators.* Baltimore, MD: The John Hopkins University, Center for Social Organization of Schools.

Ferhmann, P. G., Keith, T. Z., and Reimers, T. M. (1987). Home influence on school learning: Direct and indirect effects of parental involvement on high school grades. *Journal of Educational Research, 80*, 330-337.

Gilmour, J. E., Jr., Spiro, L. M., and Dolich, I. J. (1978). *How high school students select a college.* University Park, PA: Pennsylvania State University.

Greenberger, E., and Steinberg, L. (1983). Sex differences in early labor market experiences: Harbinger of things to come. *Social Forces, 62*, 467-486.

Heumann, J. (1993). The Heumann touch. *Counterpoint, 14*(1). Horsham, PA: National Association of State Directors of Special Education.

Hossler, D., and Stage, F. (1988, April). *Family and high school experience factors influence on the postsecondary plans of ninth-grade students.* Paper presented at the annual meeting of American Educational Research Association, New Orleans.

Jencks, C., Smith, M., Acland, H., Bane, M. J., Cohen, D., Gintis, H., Heyns, B., and Michelson, S. (1972). *Inequality: A reassessment of the effect of family and schooling in America.* New York: Basic Books, Inc.

Kaufman, P., and Bradby, D. (1992). *Characteristics of at-risk students in NELS:88.* Washington, DC: U.S. Department of Education.

Liebowitz, A. (1977). Parental inputs and children's achievement. *Journal of Human Resources, 12*, 242-251.

Marjoribanks, K. (1983). The evaluation of a family learning environment model. *Studies in Educational Evaluation, 9*(3), 343-351.

Marder, C., and Cox, R. (1991). More than a label: Characteristics of youth with disabilities. In Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R., *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Murphy, P. E. (1981). Consumer buying roles in college choice. *College and University, 57*, 141-150.

National Center for Education Statistics. (1987). *High School and Beyond: 1980 sophomore cohort. Third followup, volume 1.* Washington DC: U. S. Department of Education.

National Center for Education Statistics. (1992). *Digest of education statistics.* Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Newman, L. (1991a). Social activities. In Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R., *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Newman, L. (1991b). Growing up, moving on: Aspects of personal and residential independence. In Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R., *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Newman, L. (1992). A place to call home: Residential arrangements of out-of-school youth with disabilities. In Wagner, M., D'Amico, R., Marder, C., Newman, L., and Blackorby, J., *What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Newman, L. (1992, April). *Hispanic secondary school students with disabilities: How are they doing?* Paper presented to the Hispanic Research Issues special interest group of the American Educational Research Association annual meeting, San Francisco, CA.

Nisbet, J., Covert, S., and Schuh, M. (1992). Family involvement in the transition from school to adult life. In Rusch, F. R., Destefano, L., Chadsey-Rusch, J., Phelps, L. A., and Szymanski, E. (Eds.) *Transition from school to adult life*. Sycamore, IL: Sycamore Publishing Company.

Office of Educational Research and Improvement. (1991). *Youth indicators 1991: Trends in the well-being of American youth*. Washington, DC: U.S. Department of Education.

Rumberger, R., Ghatak, R., Poulous, G., Dornbusch, S., and Ritter, P. (1988, April). *Family influences on dropout behavior: An exploratory study of a single high school.* Presented to the American Educational Research Association annual meetings, New Orleans.

Stage, F. K., and Hossler, D. (1989). Differences in family influences on college attendance plans for male and female ninth graders. *Research in Higher Education*, *30*(3), 301-314.

U. S. Bureau of the Census. (1988). *State population and household estimates: March 1987*. Washington, DC: U.S. Government Printing Office.

Wagner, M. (1992, April). *Being female—a secondary disability? Gender differences in the transition experiences of young people with disabilities. A report from the National Longitudinal Transition Study of Special Education Students.* Presented to the Special Education special interest group of the American Educational Research Association annual meeting, San Francisco, CA.

Wagner, M., Blackorby, J., and Hebbeler, K. (1993). *Beyond the report card: The multiple dimensions of secondary school performance for students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R. (1991). *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Young, R. A. (1993). *Parental influence in the career and educational development of children and adolescents: An action perspective.* Presentation to the Fifth Annual International Roundtable on Family, Community, and School Partnerships. Atlanta, GA.

4 THE RELATIONSHIP OF SECONDARY SCHOOL FACTORS TO POSTSCHOOL OUTCOMES

The preceding chapter illustrates the important influences of disability, demographic, and family characteristics on a range of postschool outcomes. In this chapter, we turn to the relationships of secondary school factors to those same outcomes to identify aspects of secondary schools and school programs that can serve as leverage points for improving the transitions of young people with disabilities. The conceptual framework depicted in Chapter 1 illustrates the hypothesis that these school factors have direct effects on postschool outcomes, through providing job skills in vocational education, for example, as well as indirect influences on those outcomes through their effects on school performance and on other outcomes while youth were still in school.

For all youth, secondary schooling contributes to both formal and informal preparation for adult life. However, it is no secret that secondary education in general—and secondary special education specifically—has been highly scrutinized over the last decade. This attention has resulted in many reform proposals and in legislation that has changed expectations for student performance and the experiences students have while in high school. Recent NLTS reports have described in detail the nature of course-taking and other aspects of programs in secondary school for students with disabilities (Wagner, 1993). We also have demonstrated the influences that differences in school programs can have on the performance of students with disabilities while in school and on the likelihood that they will leave school by graduating (Wagner, Blackorby, and Hebbeler, 1993). Here, we examine again the important influences of school factors, this time as they relate to the postschool experiences of young adults with disabilities.

The Context of Secondary Education

Calls for educational reform in the United States became commonplace during the 1980s: Schools were criticized as dreary and sometimes dangerous places that were instructionally ineffective. Too many students exited the system functionally illiterate, leading observers to conclude that secondary schools were unlikely to produce adults capable of faring well in the labor market or competing in the international arena. These judgments renewed old debates regarding the purpose of secondary education (e.g., college vs. vocational preparation, core vs. diversified curriculum). Although we may not reach national consensus on these points soon, there is increasing agreement that the high school curriculum is focused largely on college preparation and is less suitable for the half of the population, including many young people with disabilities, that does not go on to postsecondary education (W.T. Grant Foundation, 1988).

The sometimes contradictory currents in secondary education policy and practice complicated the secondary school scene in the 1980s. Calls for higher standards and greater accountability for performance resulted in higher graduation requirements and competency testing in many states (Serow, 1984). Temporally parallel, but often at cross purposes with this movement to strengthen the academic emphasis, were the multicultural and school restructuring movements. Among other intentions, these efforts sought to restructure schools to be more democratic places for students and teachers (e.g., site-based management), to use diverse teaching methods that were sensitive to cultural differences (e.g., cooperative learning, whole language, peer tutoring), and to represent a more pluralist perspective (Banks, 1988; Bradley, 1993; Goodlad, 1984).

The special education community, too, spent considerable energy during the 1980s discussing its role and its future in American education. There was considerable controversy concerning instructional placement (Anderegg and Vergason, 1988; Stainback and Stainback, 1984), the nature of specialized instruction (Heshusius, 1986), transition to adulthood (Rusch and Phelps, 1987; Will, 1984), and the measurement of outcomes for students with disabilities (Ysseldyke, Thurlow, and Bruininks, 1992; DeStefano and Wagner, 1991). Each of these topics generated both debate regarding how special education ought to operate (Edgar, 1987; Zigmond, 1991), and model programs implementing proposed approaches (Gill and Edgar, 1990; Jenkins, Jewell, Leceister, Jenkins, and Troutner, 1990; Siegel, Robert, Greener, Meyer, Halloran, and Gaylord-Ross, 1993).

The essence of some of these special education reforms sometimes was at variance with other reform proposals in general education. For example, the inclusion of youth with a variety of disabilities in regular education classrooms implies curricular and instructional flexibility that could conflict with the hope on the part of some general education reformers for a standardized curriculum. Increased course requirements, for example, may not relate to an individual student's educational needs or may eliminate other curricular options for some youth who might otherwise have benefited from them. Such an example is vocational education, which has been associated with a host of in-school and postschool benefits for youth with disabilities (Gill and Edgar, 1990; Wagner, 1991c). Further, increased graduation requirements may actually increase the dropout rate by making a diploma even more difficult to attain for youth at risk of dropping out, including many youth with disabilities.

In this chapter, we address the postsecondary impacts of a number of characteristics of the high schools and school programs of youth with disabilities. We first look at the relationship between postschool outcomes and selected characteristics of the secondary schools attended by youth with disabilities. We then turn to the impact of the amount of instructional time spent in regular education settings and a number of curricular aspects of academic and vocational programming. We conclude with an analysis of the relationships between postschool outcomes and aspects of transition planning for 12th-grade students.

School Characteristics

All schools in the United States are not created equal. Schools and school districts differ in the populations they serve, the problems they face, and the resources they have available to handle them. In this section, we address the independent relationships between postschool outcomes and two important aspects of schools: the proportion of the student body who were in poverty and whether the school was a special school serving only students with disabilities.

We offer two cautions to readers in interpreting the influence on postschool outcomes of these aspects of students' secondary schools. First, although we expect these school characteristics to help explain variation in the postschool outcomes of young people with disabilities, the conceptual framework in Chapter 1 illustrates that these factors are somewhat removed in influence from young-adult outcomes. Much more proximal factors, such as youths' individual school programs and behaviors, are expected to contribute more powerfully to postschool success. Second, these analyses identify the independent effects of school poverty and attending special schools, holding constant the more proximal characteristics of youth themselves. Thus, for example, we are examining the added effect of attending a school with many poor students, given that we already have identified the effect of students themselves being poor (see the discussion of household income in the preceding chapter). Similarly, we are analyzing the independent effect of attending a special school, given that we know the particular disability of the youth. With this analytic approach, the effects attributable to differences in schools, independent of other characteristics of youth and their school programs, are expected to be small.

Students in Poverty

Many community and education-related problems are correlated with poverty (Pallas, Natriello, and McDill, 1989). Poverty influences many aspects of youths' lives, including their nutrition and physical health, exposure to crime, school opportunities, school performance, and dropout rates (Rumberger, 1983; Wehlage, Smith, and Lipman, 1992). NLTS reports have shown that youth with disabilities were more likely than peers in the general population to come from poor households (Marder and Cox, 1991). Youth with disabilities also attended schools where substantial proportions of the student body come from low-income families. Table 4-1 demonstrates this point. Overall, 21% of students with disabilities attended schools in which more than half of the student body were low-income; this ranged from 35% of youth who were deaf to 17% of youth with learning disabilities. We hypothesized that students who attended schools with lower rates of poverty would have fewer collateral problems to hurdle and greater resources to tackle them, which would contribute to better postschool outcomes.

Table 4-1

SECONDARY SCHOOL CHARACTERISTICS, BY DISABILITY CATEGORY

	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Visually Impaired	Hard of Hearing	Deaf	Orthopedically Impaired	Other Health Impaired	Multiply Handicapped
Percentage attending:											
Schools with more than 50% low-income students	20.9 (1.1)	17.3 (1.8)	19.9 (2.3)	27.8 (3.0)	27.8 (2.0)	25.1 (3.0)	19.5 (2.9)	35.1 (2.8)	19.3 (2.6)	31.4 (3.7)	23.5 (3.5)
n	6,533	928	573	466	929	701	603	751	582	346	565
Special schools	8.0 (.8)	1.6 (2.4)	12.4 (4.0)	4.1 (4.3)	17.2 (1.7)	34.7 (4.3)	9.0 (3.3)	63.2 3.3)	14.4 (4.1)	10.2 (5.5)	40.8 (4.4)
n	6,781	955	588	477	948	761	629	774	595	368	596

Standard errors are in parentheses.

* All conditions includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

Schools were those attended by youth with disabilities in the 1985-86 or 1986-87 school years; special and regular schools are included.

Our analyses do not support the idea that attending schools with relatively higher proportions of low-income students contributed to poorer postschool outcomes for students at those schools, independent of the income levels and other aspects of the individual students themselves (Table 4-2). Controlling for other factors, students attending schools with more low-income students generally achieved outcomes similar to those of peers attending schools with fewer low-income students. Clearly, nonschool-related factors included in the analyses were more important for postschool success than was the poverty level of the school's student body.

Two exceptions to the general absence of relationships are noted. Supporting the initial hypothesis, youth with physical disabilities who attended schools with a poorer student body were significantly less likely than similar students from less poor schools to live independently (45 percentage points, p<.01). A second exception was perplexing: students from schools with more than half of the student body living in poverty were slightly more likely to have enrolled in postsecondary academic programs than students in schools with a lower proportion of students in poverty, independent of other factors (3 percentage points, p<.10). Although these results are somewhat surprising, they are stable in direction across disabilities (but not statistically significant for subgroups). Perhaps students with disabilities in high-poverty schools had access to scholarship programs or other incentives that supported their enrollment in postsecondary academic programs.

Table 4-2

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH ATTENDING HIGH-POVERTY SECONDARY SCHOOLS

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	3.4 †	6.5	3.6	13.0	12.0
Postsecondary vocational education (percentage points)	5.7	6.9	-1.6	5.7	4.1
Competitive employment (percentage points)	-4.5	-.7	-1.2	-6.1	-7.5
Total compensation (average dollars earned)	8	757	-186	-328	-473
Independent living (percentage points)	-1.6	-1.5	3.2	-44.6 **	1.3
Profile A or B (percentage points)	2.5	-3.8	6.1	7.6	4.2
Profile E (percentage points)	.1	3.4	-1.4	-.6	3.3

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† $p<.10$; ** $p<.01$

Comparisons are between students who attended schools with half or more of the student body in poverty and those who attended schools with less than half the students who were poor.

Special Schools

Although the majority of youth with disabilities attended regular secondary schools, 8% of the population of students with disabilities attended special schools that served only students with disabilities. In particular, 63% of deaf youth, 35% of youth with visual impairments, and 41% of youth with multiple impairments attended special secondary schools (Table 4-1). These youth experienced secondary school very differently from peers who attended regular schools (Wagner, 1991b). Our analyses have investigated whether these youth also experienced different levels of postschool success, particularly for youth with higher attendance at special schools.

Table 4-3 shows little relationship between postschool outcomes and attending special schools, even for youth in the disability categories most likely to do so. The one exception for the group as a whole was that youth who had attended special schools were significantly more likely to be living independently than were peers in regular schools (16 percentage points;

Table 4-3

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH ATTENDING A SPECIAL SCHOOL

		Youth with Disabilities			
	All Youth	Mild[a]	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	1.9	--	-6.9	-36.3	-16.5
Postsecondary vocational education (percentage points)	.7	--	-3.8	-.1	-7.6
Competitive employment (percentage points)	-7.6	--	-.9	26.8	-21.1
Total compensation (average dollars earned)	637	--	554	1,395	266
Independent living (percentage points)	16.5 *	--	14.0	-	-2.8
Profile A or B (percentage points)	5.0	--	8.9	13.7	-14.1
Profile E (percentage points)	5.7	--	1.4	-.7	28.8 *

Comparison are between youth who attended special schools for those with disabilities and youth who did not.

[a] Very few youth in the mild cluster attended special schools, so that it was not possible to analyze this aspect of schooling for them.

* $p<.05$; --too few cases to analyze

$p<.05$). Also, among youth with severe impairments, attendance at special secondary schools is associated with a higher probability of being inactive in the community in the early years after secondary school (Profile E, 29 percentage points, $p<.05$).

Students' School Programs

Instructional Time in Regular Education

Few issues have been more hotly debated than that of the integration of youth with disabilities into general education classrooms. This topic has been the focus of discussion in the policy and practice arenas surrounding the Regular Education Initiative (REI), as well as the growing inclusion movement. The themes in the debate have been numerous and diverse: civil rights (Reynolds, Wang, and Wahlberg, 1987), educational philosophy (Jenkins, Pious, and Jewell, 1990; Skrtic, 1991), labeling (Gartner and Lipsky, 1987), socialization, politics (Kaufman, 1989), cost-effectiveness, and instructional efficacy (Carlberg and Kavale, 1980;

Heshusius, 1986; Lieberman, 1992; Vergason and Anderegg, 1991; Weisenstein, Stowichek, and Affleck, 1991). Many model demonstration projects have been funded to implement inclusive models, and numerous policy statements have been written by advocacy and government entities on the merits and challenges of inclusion (NASBE, 199). In this section, we examine the influence on our seven postschool measures of success of one aspect of integration: the proportion of instructional time students spent in general education classes.

Other NLTS reports have shown that most youth with disabilities in secondary school already were spending a majority of their instructional time in general education settings (Wagner, 1993). Table 4-4 shows that youth who attended regular secondary schools

Table 4-4

TIME IN REGULAR EDUCATION COURSES DURING HIGH SCHOOL

	Average Percent	Percentage of Students Whose Proportion of Time in Regular Education Was:						
	of Time	0%	1-25%	26-50%	51-75%	76-99%	100%	n
All conditions*	69.6 (1.3)	3.4 (.8)	6.8 (1.1)	16.3 (1.6)	21.3 (1.8)	31.0 (2.1)	21.3 (1.8)	2,191
Learning disabled	74.6 (1.6)	2.0 (.9)	3.3 (1.2)	13.4 (2.2)	22.1 (2.7)	39.0 (3.1)	20.2 (2.6)	399
Emotionally disturbed	74.3 (2.9)	4.2 (2.0)	5.0 (2.2)	10.4 (3.0)	20.3 (4.0)	28.1 (4.5)	32.0 (4.7)	167
Speech impaired	85.9 (2.2)	.5 (.6)	3.5 (1.6)	9.1 (2.5)	8.4 (2.4)	15.3 (3.2)	63.2 (4.2)	215
Mentally retarded	44.4 (2.2)	8.2 (2.2)	19.6 (3.2)	33.7 (3.8)	24.8 (3.4)	7.7 (2.1)	6.1 (1.9)	263
Visually impaired	86.8 (2.0)	1.9 (1.2)	1.7 (1.2)	5.9 (2.1)	8.7 (2.5)	31.0 (4.1)	50.9 (4.4)	215
Hard of hearing	75.3 (2.1)	3.1 (1.3)	6.6 (1.8)	11.3 (2.3)	16.0 (2.7)	28.6 (3.3)	34.5 (3.4)	322
Deaf	57.4 (3.2)	6.8 (2.6)	14.2 (3.6)	18.9 (4.0)	25.5 (4.5)	24.6 (4.4)	10.1 (3.1)	159
Orthopedically impaired	68.8 (2.9)	3.8 (1.6)	14.7 (3.0)	10.5 (2.6)	13.7 (2.9)	30.8 (3.9)	26.4 (3.7)	240
Other health impaired	75.4 (3.4)	2.5 (1.7)	12.3 (3.6)	7.9 (3.0)	12.1 (3.6)	27.5 (4.9)	37.7 (5.4)	137
Multiply handicapped	31.7 (5.2)	24.3 (6.9)	30.3 (7.4)	17.8 (6.1)	14.7 (5.7)	6.5 (4.0)	6.4 (3.9)	70

Standard errors are in parentheses.

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 students.

Note: Based on all students with complete transcript data.

for grades 9 through 12 spent an average of 70% of their class time in regular education classes. The average time varied from 87% for students with visual impairments to 32% for students with multiple impairments.

We have developed a number of hypotheses regarding the likely outcomes of time spent in integrated settings. First, we hypothesized that skill development and socialization in general education settings would benefit youth in all areas—postsecondary education, employment, and independence. We have further posited that time in integrated settings would most benefit youth in disability categories whose disabilities did not have cognitive deficits (e.g., sensory or physical) because they were cognitively able to deal with the higher-level content of regular courses. Also, we point to findings from other NLTS research that spending more time in regular education was associated with a higher likelihood of course failure, which in turn contributed greatly to a higher likelihood of students' dropping out of school. Given this confounding influence of regular education placements and dropping out of school, our analysis must control for school completion to identify the independent effects of placement.

Multivariate analyses confirm the hypotheses. Table 4-5 suggests that, controlling for other differences between youth, including whether they completed secondary school, more time spent in general education classrooms was positively related to employment and community

Table 4-5

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH PERCENTAGE OF TIME SPENT IN REGULAR EDUCATION CLASSES

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	4.2	7.2	-.6	19.2	-2.3
Postsecondary vocational education (percentage points)	3.2	10.4 **	-4.0	15.0	3.3
Competitive employment (percentage points)	11.2 **	1.9	15.0 *	43.2 **	-4.1
Total compensation (average dollars earned)	2,095 ***	683	1,550 **	1,664 *	755
Independent living (percentage points)	5.4	10.0 †	-.6	19.0	-6.3
Profile A or B (percentage points)	12.7 ***	14.7 ***	4.8	40.6 **	24.3 *
Profile E (percentage points)	3.1	2.6	.9	-22.1 **	-6.4

† p<.10; * p<.05; ** p<.01; *** p<.001.

Comparisons are between youth who spent all of their instructional time in regular education classes and those who spent half of their time there.

participation. Youth who spent all of their school day during secondary school in regular education settings were 11 percentage points more likely than peers who spent half of their time there to be competitively employed (p<.01) and had higher earnings ($2,095; p<.001). However, these employment advantages accrued only to youth with sensory or physical disabilities, not to the largest group of youth, those with mild impairments, or to severely impaired youth. This difference in impacts supports the hypothesis that regular education benefits youth cognitively equipped to absorb regular high school coursework.

Youth who spent more time in regular education settings, controlling for other differences, also were more likely to be fully participating in their communities (13 percentage points; p<.001). Benefits in terms of community participation were particularly strong for youth with physical disabilities; those who spent all their time in regular education classes were 41 percentage points more likely to be full community participants and 22 percentage points less likely to be inactive in their communities than youth who spent half their time there (p<.01). However, unlike the limited spread of employment advantages, youth with mild and severe disabilities also experienced community participation advantages from regular education (15 and 24 percentage points more likely to be full community participants; p<.001 and p<.05). Time spent in regular education also was associated with a greater likelihood of residential independence and postsecondary vocational enrollment for youth with mild disabilities (10 percentage points, p<.10 and p<.01).

These results, in large part, confirm the hypotheses regarding the relationship between regular education and postschool outcomes. However, two caveats must be offered. First, one should not interpret these relationships as implying that regular education necessarily caused improvements in outcomes; rather, it is possible that unmeasured competencies of youth themselves confounded these relationships. In other words, it is possible that more competent youth, in ways not measured by the skills scales and disability-related variables in the NLTS, both were more involved in regular education and achieved better postschool outcomes. Second, the importance of the fact that the other variables in the model are held constant at their means cannot be overemphasized. Of particular importance in these analyses is that the dropout variable, like all others in the model, was held constant at its mean. Thus, the unweighted mean of the dropout variable was approximately .25, reflecting the comparatively large number of graduates in the sample. Thus, our multivariate analyses regarding participation in regular education reflect in large measure the experiences of youth who had succeeded in regular education classrooms and who were more similar to graduates than to dropouts.

Academic Programs in Secondary School

Much of the school reform debate during the 1980s grappled with curricular issues (Boyer, 1983; Goodlad, 1984). In many instances, these debates have led to increased credit requirements in academic courses if students are to graduate (Catterall, 1989). These changes have broad implications for students with disabilities. Given the proportionately small number of youth with disabilities who attended postsecondary schools and the predominance of stated employment goals among 12th-graders with disabilities (Cameto, 1993), it is possible that increases in credit requirements force some students with disabilities to choose courses with an academic orientation that may not have been the most appropriate or relevant to their postschool goals. In this section, we explore the relationship between taking college preparatory academic courses and postschool outcomes for students with disabilities.

Despite the career focus of much of the transition movement, academics remained the emphasis in secondary schools for students with disabilities. The NLTS found that most youth with disabilities spent the vast majority (75%) of their instructional time in academic classes (Wagner, 1993). Some of those academic activities were clearly college preparatory in nature, and it is reasonable to suspect that substantial numbers of youth with disabilities in college preparatory academics would go on to pursue further education.

In the current analyses, we have used student enrollment in advanced mathematics or foreign language classes as a proxy measure for a college preparatory program. Recent NLTS findings suggest that 18% of students with disabilities who stayed in high school through all four grades took a foreign language class at some time, whereas 12% took an advanced math class (i.e., geometry, trigonometry, or calculus; Newman, 1993). These rates of participation ranged from 51% (advanced math) and 62% (foreign language) for youth with visual impairments to .5% (advanced math) and 5% (foreign language) for youth with mental retardation (Table 4-6). We hypothesized that participation in higher-level academic classes would positively relate to enrollment in postsecondary academic programs. We also hypothesized that youth in the sensory and physical clusters would exhibit stronger effects than peers in other clusters, because their disabilities were not associated with cognitive deficits and they took advanced courses and attended postsecondary educational institutions in greater numbers than other youth.

Table 4-6

ENROLLMENT IN ACADEMIC CONTENT COURSES, BY DISABILITY CATEGORY

	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Visually Impaired	Hard of Hearing	Deaf	Orthopedically Impaired	Other Health Impaired	Multiply Handicapped
Percentage taking:											
Advanced math†	11.8 (1.4)	10.8 (2.0)	17.4 (3.8)	35.8 (4.2)	.5 (.6)	50.9 (4.4)	33.3 (3.4)	21.9 (4.3)	33.6 (4.0)	28.8 (5.0)	3.2 (2.8)
Foreign language	17.6 (1.7)	17.2 (2.4)	20.5 (4.0)	43.6 (4.3)	4.7 (1.7)	61.8 (4.3)	28.8 (3.3)	11.6 (3.3)	40.2 (4.1)	47.7 (5.5)	8.1 (4.4)

Standard errors are in parentheses.

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

† Advanced math includes geometry, trigonometry, and calculus.

Multivariate analyses largely confirm these hypotheses (Table 4-7). Controlling for other factors in the analyses, youth with disabilities who took higher-level academic programs in high school had advantages in the areas of postsecondary education, independent living, and community participation. For example, those who took an advanced math or a foreign language class in secondary school were 22 percentage points more likely to have enrolled in postsecondary academic programs than peers who did not take such courses (p<.001), independent of other factors. Contrary to our hypotheses that college preparatory course-taking would particularly benefit those with sensory impairments in the realm of postsecondary academics, quite similar results were found across disabilities (with the exception of youth with severe disabilities). Youth who had college preparatory programs in high school also were somewhat less likely than others to enroll in postsecondary vocational programs (9 percentage points; p<.10), significantly so for youth with physical disabilities (19 percentage points; p<.05).

This type of academic training in high school also related to independent living. Youth who participated in higher-level academic coursework were significantly more likely to live independently (18 percentage points; p<.001), largely because living in a college dormitory was considered an independent living arrangement. Relationships were particularly strong for youth with mild or sensory disabilities, mirroring the positive effects noted for postsecondary education for these groups.

Table 4-7

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH TAKING ADVANCED MATH OR FOREIGN LANGUAGE COURSES

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	22.0 ***	26.9 ***	19.1 ***	25.6 *	8.6
Postsecondary vocational education (percentage points)	-8.6 †	.6	-8.5	-19.0 *	-12.2
Competitive employment (percentage points)	4.3	-2.9	-3.5	-2.0	8.7
Total compensation (average dollars earned)	175	-1,384	-654	140	1,282
Independent living (percentage points)	17.8 ***	23.5 ***	22[illegible] ***	3.1	14.2
Profile A or B (percentage points)	14.6 ***	17.8 **	17.0 **	19.0	-21.8
Profile E (percentage points)	-7.6 *	-6.7	-11.7 *	-13.5	34.0

Comparisons are between youth who took foreign language or advanced mathematics courses at any time in high school and those who did not

† p<.10; * p<.05; ** p<.01; *** p<.001

College preparatory coursework also was associated with a higher likelihood of full community participation (Profiles A or B, 15 percentage points; p<.001) and a lower likelihood of being inactive in the community (8 percentage points; p<.05). These relationships were fairly consistent across disability clusters, but statistically significant for youth with mild or sensory disabilities.

This type of academic preparation was unrelated to either of the employment measures. Perhaps in their early postschool years, students with disabilities were not getting the kinds of jobs for which advanced coursework was necessary or beneficial. Alternatively, youth who had taken advanced high school courses might still have been in college, thereby not yet experiencing employment effects of their earlier course-taking.

Thus, multivariate analyses suggest that academic training in preparation for college was related to benefits for students with disabilities as it was peers in the general population. That is, strenuous academic programs were associated with pursuing postsecondary academic programs as well as increased independence. Further, these effects seem robust for youth with all but the most severe disabilities. However, we again point out that taking advanced high school courses should not be assumed to cause further postsecondary education. Rather, taking such courses is indicative of students who expected to go on to college and were preparing to do so in their high school years. Further, as was the case in our discussion of instructional time in regular education above, these effects are contingent on the assumption that youth met with enough success in those academic programs to graduate from high school.

Vocational Course-Taking

Vocational education has a long history of providing access to job-related training, thereby increasing the chances of labor market success for many non-college-bound youth and providing a pool of skilled workers for the labor market. There has been considerable debate regarding parameters of its effectiveness (Lotto, 1988; Golloday and Wulfsberg, 1981). However, it has been viewed as an important component of secondary education and transition planning for many students with disabilities. It is believed that improved vocational skills acquired in secondary school translate into postschool employment benefits (Gill and Edgar, 1990; Hasazi and Cobb, 1988). In this section, we describe the postschool effects of participation in different degrees of high school vocational education and in work experience programs.

Recent NLTS reports suggest that almost all youth with disabilities had access to some form of vocational education in secondary school, and that many of them had those experiences as early as 9th grade (Blackorby, 1993). Far fewer students (34%), however, enrolled in a series of related classes, referred to as a concentration,* with some variation between disability categories (Table 4-8). Vocational concentrators over the 4 years of high school ranged from 40% of youth with learning disabilities to 16% of those with multiple handicaps. In previous NLTS multivariate models, students who took either survey or concentrated coursework in vocational education were significantly less likely to drop out of school than nonvocational or prevocational students (Wagner, 1991a; Blackorby, 1993).

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* A concentration in vocational education was defined as taking four or more classes within a single vocational education content area (e.g., business occupations).

Table 4-8

VOCATIONAL COURSE-TAKING IN SECONDARY SCHOOL, BY DISABILITY CATEGORY

	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Visually Impaired	Hard of Hearing	Deaf	Orthopedically Impaired	Other Health Impaired	Multiply Handicapped
Percentage taking through 12th grade:											
Survey courses only	61.5 (2.2)	57.0 (3.2)	71.2 (4.5)	64.6 (4.2)	71.0 (3.6)	72.0 (4.0)	68.2 (3.4)	73.9 (4.5)	70.8 (3.8)	66.5 (5.2)	59.8 (7.9)
Concentration	34.4 (2,1)	40.3 (3.1)	26.4 (4.4)	29.8 (4.0)	20.9 (3.2)	19.1 (3.5)	26.5 (3.2)	23.2 (4.3)	20.7 (3.4)	23.9 (4.7)	16.5 (6.0)
n	2,191	399	167	215	263	215	322	159	240	137	70

Standard errors are in parentheses.

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately for categories with at least 25 youth.

We hypothesized that vocational education had similar positive effects on both the probability of postschool employment and on wage levels. Further, we posited that the greater coordination associated with a concentration of vocational classes would result in better employment chances and wages than would accrue to students taking survey or other vocational classes. We hypothesized that vocational education would particularly benefit youth in the mild cluster, who took more vocational education and were more likely to have employment goals. We also expected vocational education to be positively related to postsecondary vocational enrollment, residential independence, and full community participation for youth in all disability categories because of improved labor market success.

Multivariate analyses partially confirmed these hypotheses regarding vocational education (Table 4-9). There were strong positive contributions of both kinds of vocational training to the probability of competitive employment (20 and 19 percentage points for vocational students, p<.05). Thus, there was no real difference in terms of finding a job between taking some occupational vocational education and taking a concentration. However, although both degrees of vocational education were associated with higher wages, taking a concentration of

Table 4-9

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH TAKING VOCATIONAL EDUCATION

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical[a]	Severe[a]
Postsecondary academic education (percentage points)					
Survey courses	10.3	3.6	2.3	--	--
Concentration	2.0	-5.7	-2.6	-28.6 *	8.6
Postsecondary vocational education (percentage points)					
Survey courses	10.4	9.5	4.8	--	--
Concentration	10.3	13.6	4.6	-1.8	-8.3
Competitive employment (percentage points)					
Survey courses	19.8 *	35.6 **	16.6	--	--
Concentration	19.0 *	39.9 ***	15.3	-5.3	-8.0
Total compensation (average dollars earned)					
Survey courses	1,097	3,993 *	1,021	--	--
Concentration	1,851 †	6,247 ***	1,071	2,009 *	-1,246
Independent living (percentage points)					
Survey courses	-5.6	-9	-9.3	--	--
Concentration	-5.2	-5.4	-10.2	-11.4	-10.0
Profile A or B (percentage points)					
Survey courses	11.0 †	18.7 †	-1.8	--	--
Concentration	9.0	17.1	-3.4	-4.5	-5.3
Profile E (percentage points)					
Survey courses	-4.7	-11.0	-11.0	--	--
Concentration	-4.3	-13.2 *	-9.4	5.6	23.9 †

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[a] The distribution of the vocational education variables for the physical and severe disability clusters did not allow the inclusion of both variables. Thus, for these two clusters, models included only concentration in vocational education.

† $p<.10$; * $p<.05$; ** $p<.01$; *** $p<.001$; --too few cases to analyze

Comparisons are between youth who took a concentration of vocational education and those who took none or only prevocational courses and between those who took survey courses and those who took none or only prevocational courses.

vocational classes was related to larger incomes than was taking no vocational education or unrelated vocational classes. Concentrators earned $1,851 ($p<.10$) more than nonvocational or prevocational students. The largest effects for both kinds of vocational course-taking accrued to youth with mild disabilities, as expected, for whom both survey courses and a concentration were associated with a probability of competitive employment almost 40 percentage points greater than those of students without vocational experiences in secondary school (p<.01 and p<.001). Further, for those youth, a concentration in vocational education was especially lucrative; concentrators earned $6,247 more annually than nonvocational or prevocational students (p<.001). Youth who took survey vocational courses also earned more—nearly $4,000 per year—than peers who took none (p<.05).

Both degrees of vocational course-taking also were associated with full community participation for youth as a whole (9 and 11 percentage points; p<.10), and particularly for mildly impaired youth. For them, both levels of vocational education were positively associated with full community participation (17 and 19 percentage points; p<.10) and negatively associated with the inactive profile (11 and 13 percentage points; p<.05).

Vocational education experiences were unrelated to postsecondary education, residential independence, or inactivity in the community for youth as a whole. However, some differences in relationships were observed for youth with different types of disability. For example, taking a concentration of vocational courses was related to a significantly lower likelihood of pursuing postsecondary academic training for youth with physical disabilities, presumably because of greater emphasis on employment for those youth. Contrary to expectations, vocational concentrators with severe disabilities demonstrated a consistent pattern of poorer postschool outcomes than nonconcentrators, although few relationships were statistically significant. The higher likelihood of being inactive in the community (Profile E) for severely impaired youth who took a concentration of vocational courses in high school, relative to similarly impaired youth who did not (24 percentage points; p<.10).

As from previous NLTS multivariate analyses, we conclude that vocational education confers substantial postschool benefits on many youth with disabilities. Regardless of the amount of vocational instruction, it appears to be associated with higher probabilities of employment and higher wages after secondary school for many youth with disabilities. Further, the pursuit of a series of related classes is likely to result in substantially higher total compensation. These effects are dramatically larger for youth with mild impairments. Thus, for youth with disabilities whose transition goals involved competitive employment, vocational education was an effective part of the transition program.

Work Experience

Work experience programs often have been thought of as the finishing touch to vocational preparation in secondary school. Indeed, much research suggests that paid work experience is more likely to result in jobs for pay after school because it offers youth a chance to develop work-related skills in real work situations (Hasazi, Gordon, and Roe, 1985). Many of the demonstration models developed since the beginning of the transition initiative employ principles similar to those in traditional work experience programs in vocational education (Rusch and Phelps, 1987; Siegel et al., 1992). This section explores the postschool impacts of work experience programs for youth with disabilities.

Recent NLTS reports found work experience programs to be part of the secondary educational experience for many youth with disabilities (Blackorby, 1993). Overall participation was nearly 40% over the 4 years of high school. Table 4-10 shows a range across disability of 50% for youth with multiple impairments to 27% for their peers with visual impairments. In addition, Wagner, Blackorby, and Hebbeler (1993) found that participation in work experience programs was associated with a number of positive secondary school outcomes, notably a reduced dropout rate.

Table 4-10

ENROLLMENT IN WORK EXPERIENCE PROGRAMS

	Percentage Participating in High School Work Experience Program	Standard Error	n
All conditions*	38.8	1.5	4,320
Learning disabled	38.7	2.2	819
Emotionally disturbed	29.7	2.9	420
Speech impaired	32.4	3.1	381
Mentally retarded	44.9	2.5	660
Visually impaired	26.9	3.1	357
Hard of hearing	33.5	2.7	528
Deaf	39.7	4.1	247
Orthopedically impaired	40.4	3.1	435
Other health impaired	38.0	3.8	279
Multiply handicapped	49.6	4.9	186

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 students.

We hypothesized that youth who took part in work experience programs in high school would experience greater success in the postschool employment market because of the greater experience in more realistic work situations offered by work experience programs. Like general vocational education, we posited that work experience would benefit youth in the mild cluster more than youth in other disability clusters.

Our analyses do not fully support our hypotheses for all youth with disabilities (Table 4-11). When other variables were included in the analyses, particularly taking survey or a concentration of vocational education, work experience did not make a significant added contribution to any outcomes for youth with disabilities as a group. It is likely that the skills and foci of work experience programs and vocational education in general were similar and the two factors were confounded when we consider youth with disabilities overall. However, these findings do not apply uniformly to youth with different disabilities. Work experience was positively and significantly associated with employment for youth with physical impairments and, to a lesser extent, those with mild disabilities. For example, youth with physical disabilities who had been in work experience programs in secondary school were significantly more likely to find competitive employment (33 percentage points, p<.05) and were estimated to earn $4,196 more annually (p<.001) than peers who did not have such experiences, over and above the contribution of vocational course-taking. These results were similar but somewhat smaller for youth in the mild cluster (10 percentage points, $1,379; p<.10 and n.s.).

Table 4-11

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH PARTICIPATING IN SECONDARY SCHOOL WORK EXPERIENCE PROGRAMS

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	-9.3 *	-7.3	1.0	-30.9 *	-9.9
Postsecondary vocational education (percentage points)	5.6	1.1	3.6	2.7	5.3
Competitive employment (percentage points)	-2.0	10.4 †	-11.3	32.6 *	-3.4
Total compensation (average dollars earned)	542	1,379	-697	4,196 ***	-335
Independent living (percentage points)	6.2	3.7	6.8	12.6	2.7
Profile A or B (percentage points)	3.8	-.6	3.5	12.5	5.9
Profile E (percentage points)	-1.0	1.5	6.7	-13.9	-3.5

† p<.10, * p<.05; *** p<.001

Comparisons are between youth who participated in high school work study programs and those who did not.

Transition Planning

Within the last decade, there has been increased emphasis on involving schools in planning for the transition of students with disabilities from school to adult life. This transition initiative was articulated and expanded in the mid 1980s (Will, 1984; Halpern, 1985). Transition planning has been described as an extended process of planning for adult activity in the interrelated domains of education, postsecondary education and training, employment, and independent living. Transition planning is expected to begin early in secondary school and involve students, parents, personnel from schools, and appropriate community agencies (Wehman, Kregel, Barcus, and Schalock, 1986). Although transition to adult life was mentioned in earlier legislation and some discretionary funds were made available to support it on a small scale, it was not until 1990 that transition planning for students in special education ages 16 and older was mandated in P.L.101-476. Before this legislation, states were left to determine the extent of their schools' involvement in transition planning. Because the NLTS collected data before the transition legislation was enacted, the transition planning done with or for students in the study can be seen as a baseline from which to compare future transition efforts and can suggest the possible effects of transition planning when it becomes more widespread.

NLTS data on transition planning come from reports of teachers of students with disabilities who were familiar with the programs of specific sample students. Teachers completed survey questionnaires on the students' school programs, including items that described the nature and the extent of transition planning done on behalf of the students. Teachers were asked whether students had transition plans, when they were initiated, and if the plans were written documents. They were asked to report on the primary goal(s) identified for students after high school and which persons or organizations the school contacted regarding postsecondary programs or employment for students preparing to leave school.

Earlier NLTS reports on transition planning provided by schools found that about 78% of students with disabilities in the 12th grade had transition plans (Cameto, 1993). This is a substantial portion of youth to have been the subject of transition planning before federal law required it of schools. Although schools were not required to document transition planning in writing, written transition plans are preferred to less formal plans because goals and responsibility can be more clearly defined in a written document. Only 44% of students had written transition plans, slightly more than half of those who had a plan. This indicates that transition planning was a fairly informal process for many students. There is some indication that formal written plans were more typical for more severely disabled students.

Three types goals of were most commonly identified for students after leaving high school: postsecondary education at a 2- or 4-year college, vocational training, and employment. Employment was the goal for the majority (56%) of youth with disabilities. Academic postsecondary education and vocational training were the goals for other youth with disabilities in about equal proportions. To facilitate the transition of students from secondary school to postsecondary education and training or employment, schools can contact a variety of organizations on behalf of students with disabilities. The state Vocational Rehabilitation (VR) agency was contacted more often than any other program or employer. Schools also contacted colleges, vocational training programs, job placement programs, and employers directly at about the same rates. Colleges were contacted for a surprising percentage of students, given the low rate at which students with disabilities enrolled in 2- or 4-year colleges in the early years after secondary school.

We selected a number of transition planning variables to be included in the multivariate analyses: the degree of formality of transition planning, the type of transition goal, and the types of contacts made by schools.

- We constructed a 3-point scale that indicates whether the student had no transition plan (a value of zero), a plan generated through an informal process (a value of 1), or a formal written document (a value of 2). We hypothesize that having a more formal transition plan would lead to more positive adult outcomes in all domains, because all domains would be addressed and areas of responsibility clarified in a formal plan.
- We investigated whether having a specified goal for the student's postschool years led to greater success in that area. The analyses included three possible goals: academic postsecondary education, vocational postsecondary education, and competitive employment. We hypothesized that there would be a positive effect of having a particular goal for the relevant outcome; e.g., a student with a goal of competitive employment would be expected to have a more positive competitive employment outcome than a student who did not have that goal.
- Finally, we explored the effect schools had on assisting youth in transition by making contacts on behalf of students to enroll them in a postsecondary education or training program or to secure employment for them. We expected that making contacts on behalf of students for a particular type of postschool activity would lead to success in that area.

The results of the analyses regarding the contribution of transition planning to postschool outcomes were mixed (Table 4-12). Particularly striking is the absence of significant findings across all outcomes for the effects of formalized transition planning. Having a specific goal to focus efforts on had a positive impact on the achievement of that goal for youth with disabilities. Students who had a goal to pursue an academic postsecondary education were 21 percentage points more likely than students who did not have such a goal to enroll in an academic postsecondary education institution ($p<.05$), independent of having taking college preparatory coursework or other factors in the analyses. Similarly, students who had a goal to pursue vocational postsecondary training were 11 percentage points more likely to enroll in a vocational training program ($p<.05$). For students who had a goal to find competitive employment, the results were positive by 7 percentage points, but not statistically significant.

The impacts the schools had in making contacts on behalf of students to help them reach their goals were all positive, but were statistically significant only for the goal of academic postsecondary education. When schools had contacted 2- or 4-year colleges on behalf of students, students were 23 percentage points more likely to enroll in a postsecondary school than when the schools had not made such contacts ($p<.05$). Secondary schools have a long history and developed expertise in facilitating the transition of college-bound students' to academic postsecondary schools. The relationships between secondary schools and vocational training programs are probably less institutionalized. The process of helping young people prepare for and find employment is a newer and more difficult endeavor that schools have just begun to take on.

Table 4-12

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH TRANSITION PLANNING, TRANSITION GOALS, AND TRANSITION CONTACTS

	Estimated Change in:						
	Postsecondary Academics (Percentage Points)	Postsecondary Vocational (Percentage Points)	Employment (Percentage Points)	Total Compensation (Average dollars earned)	Independent Living (Percentage Points)	Profile A or B (Percentage Points)	Profile E (Percentage Points)
Transition planning							
Had written plan vs. no plan	7.5	.0	-17.0	-1,597	2.7	11.8	-4.6
Transition goals							
Student's transition goal was:							
Postsecondary academic training	20.5 *	--	--	--	--	--	--
Postsecondary vocational training	--	11.0 *	--	--	--	--	--
Competitive employment	--	--	7.3	--	--	--	--
Contacts made in transition planning							
School contacted for student:							
2- or 4-year college	23.0 *	--	--	--	--	--	--
Vocational school	--	8.8	--	--	--	--	--
Potential employers	--	--	11.4	--	--	--	--

* p<.05; --too few cases to analyze

Summary

This chapter has shown that many aspects of secondary school programs do have a positive influence on youths' lives once they leave secondary school. It also has shown that the relationships between the programs and outcomes are very complex and are not uniform across outcomes or types of disability. Our results regarding participation in regular education and higher-level academic coursework are conditional on success in those areas. Further, relationships varied by disability and outcome measure. Thus, programmatic decision-making on the individual level requires that disability, program, and transition goal be included in the process. Our results suggest that this process does work well for many youth with disabilities. There clearly is room for improvement, particularly for youth in some disability categories.

References

Anderegg, M. L., and Vergason, G. A. (1988). An analysis of one of the cornerstones of the regular education initiative. *Focus on Exceptional Children, 20*(8), 1-8.

Banks, J. A. (1988). *Multiethnic education—Theory and practice*. Boston: Allyn and Bacon, Inc.

Blackorby, J. (1993). Partcipation in vocational education by students with disabilities. In Wagner, M. (Ed.), *The secondary school programs of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Boyer, E. L. (1983). *High school: A report on secondary education in America*. New York: Harper and Row.

Bradley, A. (1993, May 19). Advocates seek to make small schools the rule, not the exception. *Education Week*, p. 5.

Cameto, R. (1993). Support services provided by secondary schools. In Wagner, M. (Ed.), *The secondary school programs of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Carlberg, C., and Kavale, K. (1980). The efficacy of special versus regular class placement for exceptional children: A meta-analysis. *Journal of Special Education, 14*(3), 293-309.

Catterall, J. S. (1989, November). Standards and school dropouts: A national study of tests required for high school graduation. *American Journal of Education*.

DeStefano, L., and Wagner, M. (1991). *Outcome assessment in special education: Lessons learned*. Urbana, IL: Secondary Transition Intervention Effectiveness Institute.

Edgar, E. (1987). Secondary programs in special education: Are many of them justifiable? *Exceptional Children, 53*(6), 555-561.

Gartner, A., and Lipsky, D. (1987). Beyond special education. *Harvard Educational Review, 57*, 367-395

Gill, D., and Edgar, E. (1990). Outcome of a vocational program designed for students with mild disabilities: The Pierce county vocational/special education cooperative. *The Journal for Vocational Special Needs Education*, *12*(3), 17-22.

Goodlad, J. I. (1984). *A place called school*. NewYork: McGraw-Hill.

Golloday, M. A., and Wulfsberg, R. M. (1981). *The condition of vocational education*. Washington, DC: National Center for Education Statistics.

Halpern, A. S. (1985). Transition: A look at the foundations. *Exceptional Children, 51*(6), 479-486.

Hasazi, S., Gordon, L. R., and Roe, C. A. (1985). Factors associated with the employment status of handicapped youth exiting high school from 1979 to 1983. *Exceptional Children, 51*(6), 455-469.

Hasazi, S., and Cobb, R. B. (1988). Vocational education of persons with mild handicaps. In Gaylord-Ross, R. (Ed.), *Vocational education for persons with handicaps* (pp. 331-354). Mountain View, CA: Mayfield Publishing.

Heshusius, L. (1986). Pedagogy, special education, and the lives of young children: A critical and futuristic perspective. *Journal of Education, 168*(1), 25-38.

Jenkins, J. R., Jewell, M., Leicester, N., Jenkins, L., Troutner, N. (1990). *Development of a school building model for educating handicapped and at risk students in general education classrooms*. Paper presented at the annual meeting of the American Educational Research Association, Boston.

Jenkins, J. R., Pious, C. G., and Jewell, M. (1990). Special education and the Regular Education Initiative: Basic assumptions. *Exceptional Children, 56*(6), 479-491.

Kauffman, J. M. (1989). The Regular Education Initiative as Reagan-Bush education policy: A trickle down theory for the hard-to-teach. *The Journal of Special Education, 23*(3), 256-278.

Lieberman, L. M. (1992). Preserving special education...for those who need it. In Stainback, W., and Stainback, S. (Eds.), *Controversial issues confronting special education: Divergent perspectives.* Boston: Allyn and Bacon.

Lotto, L. S. (1988). What about vocational education: A review of the evidence. *Educational Policy, 2*(3), 265-285.

Marder, C., and Cox. R. (1991). More than a label: Characteristics of youth with disabilities. In Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R., *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Newman, L. (1993). Academic course-taking. In Wagner, M. (Ed.), *The secondary school programs of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Pallas, A. M., Natriello, G., and McDill, E. L. (1989). The changing nature of the disadvantaged population: Current dimensions and growth. *Educational Researcher, 18*(5), 16-22.

Reynolds, M. C., Wang, M. C., and Wahlberg, H. J. (1987). The necessary restructuring of special and regular education. *Exceptional Children, 53*(5), 391-398.

Rumberger, R. (1983). Dropping out of high school: The influence of race, sex and family background. *American Educational Research Journal, 20*, 199-220.

Rusch, F. R., and Phelps, L. A. (1987). Secondary special education and transition from school to work: A national priority. *Exceptional Children, 53*, 487-492.

Schumaker, J., and Deschler, D. (1988). Implementing the regular education initiative in secondary schools. *Journal of Learning Disabilities, 21*, 36-42.

Serow, R. C. (1984). Effects of minimum competency testing for minority students: A review of expectations and outcomes. *Urban Review, 16*, 67-75.

Sewell, W. H., Hauser, R. M., and Wolf, W. (1980). Sex, schooling, and occupational status. *American Journal of Sociology, 86*(3), 551-583.

Siegel, S., Robert, M., Greener, K., Meyer, G., Halloran, W., and Gaylord-Ross, R. (1993). *Career ladders for challenged youths in transition from school to adult life*. Austin: PRO-ED.

Skrtic, T. (1991). The special education paradox: Equity as the way to excellence. *Harvard Educational Review, 61*(2), 148-206.

Stainback, W., and Stainback, S. (1984). A rationale for the merger of special and regular education. *Exceptional Children, 51*, 102-111.

Vergason, G. A., and Anderegg, M. L., (1991). Beyond the regular education initiative and the resource room controversy. *Focus on Exceptional Children, 23*(7), 1-10.

Wagner, M. (Ed.). (1993). *The secondary school programs of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Wagner, M. (1991a). *Dropouts with disabilities: What do we know? What can we do?* Menlo Park, CA: SRI International.

Wagner, M. (1991b). Secondary school programs. In Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C., and Cox, R., *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Wagner, M. (1991c). *The benefits of secondary vocational education for young people with disabilities, Findings from the National Longitudinal Transition Study*. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Wagner, M., Blackorby, J., and Hebbeler, K. (1993). *Beyond the report card: The multiple dimensions of secondary school performance for students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students*. Menlo Park, CA: SRI International.

Wehlage, G., Smith, G., and Lipman, P. (1992). Restructuring urban schools: The new futures experience. *American Educational Research Journal, 29*(1), 51-93.

Wehman, P., Kregel, J., Barcus, J. M., and Schalock, R. L. (1986). Vocational transition for students with developmental disabilities. In Kiernan, W. E., and Stark, J. A., (Eds.), *Pathways to employment for adults with developmental disabilities*. Baltimore: Paul H. Brookes.

Weisenstein, G. R., Stowitschek, J. J., and Affleck, J. Q. (1991). Integrating students enrolled in special education into vocational education. *Career Development for Exceptional Individuals, 14*(2), 131-144.

Will, M. C. (1984). *Bridges from school to working life*. Washington, DC. Office of Special Education and Rehabilitative Services.

W. T. Grant Foundation. (1988). *The forgotten half: Non-college youth in America*. Washington, DC: Author.

Ysseldyke, J. E., Thurlow, M. L., and Bruininks, R. H. (1992). Expected outcomes for students with disabilities. *Remedial and Special Education, 13*(6), 19-30.

Zigmond, N. (1991). Rethinking secondary special school programs for students with learning disabilities. *Focus on Exceptional Children, 23*, 1-22.

5 THE CONTRIBUTION OF STUDENT BEHAVIOR AND PERFORMANCE IN SECONDARY SCHOOL TO POSTSCHOOL OUTCOMES

The conceptual framework of the transition process shown in Chapter 1 hypothesizes the pivotal role of student outcomes in that process. According to this conceptualization, the educational, employment, and social outcomes of youth with disabilities while they are secondary school students are products, in part, of their schools and school experiences. In turn, those student outcomes are expected to contribute to the outcomes youth experience in their young adult years. According to this framework, success in school breeds success later; poor performance in school sets the stage for poor outcomes in the postschool years.

Here we explore the extent to which the assumptions of a continuum of outcomes applied to young people with disabilities on the dimensions of postsecondary education, employment, residential independence, and community participation investigated by the NLTS. Specifically, we address three aspects of student outcomes—academic performance, student behavior at school, and social involvement while students were in secondary school—and assess their relationships to the postschool outcomes of youth with disabilities.

Academic Performance

Conventional wisdom tells us that students who do well in school are on their way to success in adulthood. This conventional wisdom is particularly popular with parents, who recite it often in an effort to encourage their children to be conscientious students. "Study hard so you can go to college." "Get good grades so you can get a good job." "If you don't graduate, you'll never get anywhere in life." To what extent did these articles of faith apply to young people with disabilities?

To answer this question, we have included in our analyses four measures of academic performance. Our primary indicator of academic performance is whether youth dropped out of school, rather than persisting in school until they graduated or exceeded the maximum age of attendance. Leaving school without a diploma or certificate of attendance or completion deprives a young person of the credential that is a prerequisite for many adult opportunities, particularly in the area of postsecondary education and training. Thus, we hypothesized that dropping out of school contributed powerfully to limiting opportunities and hampering the success of students in their early postschool years, a hypothesis supported by previous NLTS research (Wagner, 1991).

If these negative effects accrue to students who dropped out, they were experienced by a sizable proportion of young people with disabilities. Overall, 30% of students with disabilities who had been enrolled in 9th through 12th grades left school by dropping out; an additional

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8% of youth left school before reaching 9th grade. This dropout rate was particularly high for youth classified as learning disabled or seriously emotionally disturbed (Table 5-1), among whom 48% of students who made it to 9th grade eventually dropped out. NLTS analyses have also shown relatively higher dropout rates for youth who were African American. Having a serious emotional disturbance or being African American have been demonstrated to relate to poorer postschool outcomes (see Chapter 3). Thus, multivariate analyses are needed to show whether it is dropping out or the characteristics of drop outs that negative affect postschool outcomes.

Table 5-1

PERCENTAGE DROPPING OUT OF 9TH THROUGH 12TH GRADES,[a] BY DISABILITY CATEGORY

	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Visually Impaired	Hard of Hearing	Deaf	Orthopedically Impaired	Other Health Impaired	Multiply Handicapped
Percentage dropping out in:											
9th grade	5.3	4.4	8.6	6.1	7.3	1.8	3.5	1.1	1.3	5.4	.7
	(.7)	(.9)	(1.8)	(1.7)	(1.4)	(1.0)	(1.1)	(.9)	(.8)	(1.9)	(1.1)
n	4,368	889	475	396	635	374	522	262	421	270	118
10th grade	6.6	5.5	14.9	3.8	7.4	4.7	2.5	.5	3.2	7.5	1.7
	(.8)	(1.1)	(2.4)	(1.4)	(1.5)	(1.6)	(1.0)	(.6)	(1.2)	(2.3)	(1.8)
n	4,158	848	431	369	590	367	505	259	413	254	116
11th grade	9.8	9.6	16.2	7.1	9.5	3.4	4.7	5.9	4.1	11.4	7.3
	(1.0)	(1.4)	(2.7)	(1.9)	(1.7)	(1.4)	(1.4)	(2.1)	(1.4)	(2.9)	(3.5)
n	3,917	794	368	351	550	350	491	258	400	235	114
12th grade	8.9	9.7	16.0	6.1	5.5	2.2	3.3	3.5	4.4	4.7	1.5
	(1.0)	(1.5)	(2.9)	(1.9)	(1.4)	(1.1)	(1.2)	(1.7)	(1.5)	(2.1)	(1.7)
n	3,528	699	305	319	488	329	465	239	370	202	106
Cumulative for 4 grades	29.9	28.5	48.1	23.4	29.9	12.1	14.9	11.2	13.5	27.4	13.5
	(1.0)	(2.0)	(3.1)	(2.9)	(2.5)	(2.4)	(2.2)	(2.8)	(2.4)	(3.8)	(4.5)
n	4,399	897	483	398	643	375	523	263	420	271	120

Standard errors are in parentheses.

[a] Does not include 8% of school leavers who dropped out of school before 9th grade.

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

Table 5-2 demonstrates that dropouts with disabilities had consistently poorer postschool outcomes than their peers who persisted in school, independent of other differences between them. Dropouts were less likely to enroll in postsecondary vocational programs (14 percentage points; $p<.05$) and academic programs (12 percentage points). However, the relationship to postsecondary academic education is statistically significant only for youth with mild disabilities, those most likely to have dropped out (14 percentage points; $p<.05$).

Table 5-2

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH STUDENTS' DROPPING OUT

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe[a]
Postsecondary academic education (percentage points)	-11.6	-14.1 *	-1.6	-27.6	--
Postsecondary vocational education (percentage points)	-13.8 *	-5.4	-6.2	-6.8	--
Competitive employment (percentage points)	-8.0	-3.2	1.8	-16.3	--
Total compensation (average dollars earned)	-1,023	-617	-1	1,399	--
Independent living (percentage points)	-2.8	-7.8 *	4.6	8.0	--
Profile A or B (percentage points)	-20.3 ***	-21.0 **	-23.5 †	-15.3	--
Profile E (percentage points)	8.9 *	12.6 *	1.7	-5.8	--

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[a] There were too few dropouts with severe disabilities to analyze this relationship for that cluster of youth.

† p<.10; * p<.05; ** p<.01; *** p<.001; --too few cases to analyze

Comparisons are between youth who dropped out and youth who persisted to graduation on the maximum age for school attendance.

Consistently negative, though weak, relationships were found between dropping out of secondary school and employment and residential independence outcomes for youth with disabilities as a group when other factors in the analyses were controlled. However, strong relationships were found for the dimension of community participation. Dropouts were estimated to be 20 percentage points less likely than persisters to be fully participating in their communities (Profile A or B; p<.001) and 9 percentage points more likely to demonstrate low community participation (Profile E; p<.05). These relationships are particularly striking for youth with mild or sensory disabilities.

We also examined the independent relationships to outcomes of three other aspects of academic performance for a subsample of youth: the grade point average students earned while they were in school and their performance levels in reading and in mathematics. Readers should note that these analyses were conducted using extended models (see Chapter 2) and data from the student school program survey, which were available primarily for a relatively small sample of 12th-graders who were mildly impaired. Thus, findings generalize to these youth only, not to youth who may have left school before 12th grade.

Although we expected stronger academic performance on these measures to contribute to more positive postschool outcomes, we did not expect their effects to be strong, independent of whether students dropped out. In other words, given that students either graduated or dropped out, we did not expect their particular grade point average or reading ability to have powerful additional effects on many outcomes. The exception to this expectation is that grade performance and reading and mathematics abilities were expected to be strongly related to enrollment in postsecondary academic programs because acceptance into such programs often is competitive and based on just such indicators of academic performance.

Table 5-3 shows little relationship between additional measures of academic performance and postschool outcomes for youth with disabilities, as expected. Also as expected, the exception relates to postsecondary academic training. For example, youth who had B averages were estimated to be 18 percentage points more likely to have enrolled in a postsecondary academic program than students with a D average in high school, independent of other factors. One additional significant relationship concerns the higher likelihood of better students' living independently (15 percentage points, p<.05), probably due to the higher incidence of living in college dormitories that was associated with postsecondary academic enrollment.

Table 5-3

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH GRADE POINT AVERAGE AND READING AND MATHEMATICS ABILITIES

	Difference in Outcomes Associated With:		
	Grade Point Average	Years Behind in Reading Ability	Years Behind in Math Ability
Postsecondary academic education (percentage points)	17.6 †	.3	-1.9
Postsecondary vocational education (percentage points)	8.2	2.3	-2.8
Employment (percentage points)	.0	-10.5	.0
Total compensation (average dollars earned)	2,535	-757	119
Independent living (percentage points)	15.3 *	3.4	-8.5
Profile A or B (percentage points)	-8.7	-1.7	5.6
Profile E (percentage points)	.0	5.1	.0

† p<.10; * p<.05

Comparisons for GPA are between youth with a B average and those with a D average. For reading and mathematics ability levels, comparisons are between youth who read or compute a grade level and those whose abilities were 3 years behind grade level.

Classroom Behaviors

Research on students in the general population has demonstrated the strong relationship between students' attentiveness to school-related tasks and school performance (Kaufman and Bradby, 1992). It seems reasonable to hypothesize that students who exhibited positive classroom behaviors might also be youth who exhibit positive behaviors later in life, contributing to more positive outcomes overall.

To identify whether such relationships existed for youth with disabilities, information was collected for a subsample of 12th-graders who were mildly impaired (see Chapter 2 for a description of this subsample). Teachers of these students were asked to rate how well they complied with the behavioral norms of the classroom in terms of (1) getting along with others in class, (2) following directions, and (3) controlling their behavior in class. Teachers rated each aspect of behavior on a 4-point scale ranging from "very well" to "not at all well". Scores for individual items were combined into a 6-category scale on which a score of 1 meant that all 3 behaviors were done "not at all well," and a 6 indicated that all 3 behaviors were done "very well." Further, teachers were asked to rate student's behavior in each of four settings in which the student may have been placed: regular education academic classes, special education academic classes, regular education vocational classes, and work experience programs.

A task performance scale was created in a manner quite similar to the behavioral norm scale. Using a 4-point scale ranging from "rarely" to "always", teachers were asked to rate students on how often they (1) completed homework on time; (2) took part in group discussions in class; and (3) stayed focused on class work. Responses were grouped logically into a 7-point scale. Teachers were asked about students' behavior in three settings: regular education academic classes, regular education vocational classes, and special education classes.

According to Table 5-4, there was a general pattern across instructional settings for approximately half of students with disabilities to be rated highly by their teachers in terms of getting along with others, following directions, and controlling their behavior in class. High ratings ranged from 47% in regular education vocational classes to 56% in work experience programs. Approximately one-third of students with disabilities received medium ratings and a minority of students were rated low in their in-class behavior. More low ratings were received in regular education academic classes (18%).

Compared with in-class behavior, students' performance on class-related tasks, such as completing homework, participating in group discussions, and staying focused on class work was rated lower overall by teachers (Table 5-5). The most common rating was "sometimes" ranging from 48% to 51%. Students were more likely to be rated highly in special education than in vocational education classes; they were least likely to get a high rating in regular education academic classes. One-quarter of students with disabilities were described in the ratings as "rarely" meeting the responsibilities of an academic class.

Table 5-4

BEHAVIORAL NORM SCALE SCORES,[a] BY DISABILITY CATEGORY

Instructional Setting	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Hearing Impaired	Orthopedically/ Health Impaired
Percentage receiving rating in:							
Regular education academic classes							
Low	19.7 (3.6)	15.9 (4.4)	32.8 (95)	13.2 (6.1)	31.5 (8.0)	10.6 (7.2)	27.2 (12.2)
Medium	34.2 (4.2)	36.7 (5.8)	29.9 (9.3)	22.4 (7.6)	30.2 (7.9)	28.2 (10.5)	25.4 (11.9)
High	(46.1 (4.5)	47.4 (6.1)	37.2 (9.8)	64.6 (8.7)	38.3 (8.4)	61.2 (11.4)	47.4 (13.6)
Special education academic classes							
Low	14.6 (3.4)	8.9 (4.2)	12.9 (8.3)	13.6 (10.6)	20.1 (5.5)	0.8 (2.1)	8.8 (7.1)
Medium	34.5 (4.6)	41.3 (7.3)	55.3 (12.3)	46.2 (15.5)	38.5 (6.7)	28.1 (10.6)	47.1 (12.5)
High	50.9 (4.9)	49.9 (7.4)	31.8 (11.5)	40.2 (15.2)	41.5 (6.8)	71.0 (10.7)	44.1 (12.4)
Regular education vocational classes							
Low	12.1 (3.2)	10.9 (4.0)	20.3 (9.9)	9.5 (6.1)	27.7 (8.0)	9.4 (6.6)	17.6 (11.8)
Medium	41.9 (4.9)	33.8 (6.2)	47.0 (12.3)	32.0 (9.8)	34.9 (8.5)	20.3 (9.2)	32.9 (14.6)
High	46.7 (4.9)	55.3 (6.5)	32.6 (11.5)	58.5 (10.3)	37.3 (8.6)	70.3 (10.4)	59.5 (15.5)
Work experience programs							
Low	12.6 (3.6)	9.3 (4.7)	9.5 (8.5)	7.3 (6.8)	22.7 (6.8)	15.5 (9.4)	5.4 (6.6)
Medium	32.7 (5.1)	28.7 (7.3)	38.7 (14.1)	44.1 (13.0)	39.2 (7.9)	25.5 (11.4)	43.7 (14.5)
High	54.6 (5.4)	62.0 (7.8)	51.8 (14.5)	48.6 (13.1)	38.1 (7.9)	59.0 (12.8)	50.9 (14.6)
n	473	147	63	89	66	44	41

Standard errors are in parentheses.

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

[a] Levels of ratings were low (1-2), medium (3-4), and high (5-6).

Table 5-5

TASK PERFORMANCE RATINGS,[a] BY DISABILITY CATEGORY

Instructional Setting	All Conditions*	Learning Disabled	Emotionally Disturbed	Speech Impaired	Mentally Retarded	Hearing Impaired	Orthopedically/ Health Impaired
Percentage of students receiving rating in:							
Regular education academic classes							
Rarely	24.8 (4.0)	22.4 (5.2)	30.3 (9.5)	20.8 (7.4)	35.3 (8.8)	10.9 (7.7)	26.6 (12.2)
Sometimes	47.9 (4.7)	50.5 (6.3)	47.3 (10.3)	31.2 (8.5)	42.5 (9.1)	46.5 (12.3)	32.8 (13.0)
Almost always	27.4 (4.2)	27.1 (5.6)	22.4 (8.6)	48.0 (9.1)	22.2 (7.6)	42.6 (12.2)	40.6 (13.6)
Special education academic classes							
Rarely	17.2 (4.2)	19.4 (6.2)	12.4 (9.1)	10.5 (10.4)	14.4 (5.0)	12.9 (8.1)	17.1 (10.0)
Sometimes	44.8 (5.5)	39.4 (7.6)	46.0 (13.7)	73.3 (15.0)	55.6 (7.1)	31.6 (11.3)	49.2 (13.3)
Almost always	38.0 (5.2)	41.2 (7.7)	41.6 (13.6)	16.2 (12.5)	30.0 (6.5)	55.5 (12.2)	33.7 (12.5)
Regular education vocational classes							
Rarely	17.9 (4.0)	15.1 (5.1)	25.4 (12.8)	19.2 (9.2)	29.2 (9.2)	13.2 (8.3)	9.6 (9.1)
Sometimes	46.2 (5.3)	46.2 (7.0)	52.3 (14.7)	24.4 (11.1)	44.6 (10.1)	59.4 (12.0)	55.2 (15.3)
Almost always	35.9 (5.2)	38.6 (6.9)	22.3 (12.3)	46.5 (11.6)	26.3 (8.9)	27.4 (10.9)	35.2 (14.7)
n	447	147	63	89	66	44	41

Standard errors are in parentheses.

* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

[a] Levels of ratings were rarely (1-2), sometimes (3-5), and almost always (6-7).

For the extended models, we combined the ratings for the various settings to obtain a total score for classroom behavior and for task orientation across settings. We expected relationships between the behavior scale scores and all postschool outcomes to be positive, except for being inactive in the community (Profile E). We further expected there to be a positive relationship between students with disabilities' meeting the demands of the courses they were taking and being able to continue their education at the postsecondary level. We also expected that higher-performing students on classroom tasks would fare better in the employment market and be more likely to be employed in jobs that paid higher wages. We did not expect these classroom tasks to be predictive of other independent living outcomes.

These hypotheses largely were confirmed, although most relationships were not strong. Table 5-6 shows that youth with higher teacher ratings on adherence to classroom behavioral norms tended to have more positive outcomes, although only the contribution to full community participation was statistically significant (27 percentage points; p<.10). Students who were rated highly by their teachers on classroom tasks were 23 percentage points more likely to go on to academic postsecondary education (p<.10). Completing homework, participating in classroom discussions, and staying focused on the subject matter are activities required to succeed in an academic setting. It is not surprising that students successful at these tasks—and likely successful in academics—would want to continue this type of experience. Although youth with higher classroom task ratings were only slightly more likely than youth who had low ratings to be employed, they were significantly more likely to earn a higher wage by $3,395 per year than their peers with low ratings (p<.10). These higher wages may have resulted from greater job stability and longevity with particular employers that might have characterized youth who were more task oriented. As expected, we did not find positive relationships between classroom task completion and other adult outcomes.

Table 5-6

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH IN-CLASS BEHAVIORS IN SECONDARY SCHOOL

	Teacher Rating of Youth's Compliance with In-Class Behavioral Norms	Teacher Rating of Youth's Classroom Task-Related Behaviors
Postsecondary academic education (percentage points)	6.4	22.8 †
Postsecondary vocational education (percentage points)	9.6	3.8
Competitive employment (percentage points)	11.5	2.6
Total compensation (average dollars earned)	780	3,395 †
Independent living (percentage points)	4.6	-7.1
Profile A or B (percentage points)	27.4 †	-12.9
Profile E (percentage points)	-14.7	-2.1

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† p<.10; * p<.05; ** p<.01; *** p<.001

Comparisons are between youth with high scale scores (12) and those with low scores (6).

Social Involvement While in Secondary School

Much previous research has demonstrated that, regardless of disability, students engage in social activities that affect their school experience and may ultimately influence their postschool outcomes. Two types of student social activities were considered in the multivariate analyses: social contacts with peers, and participation in school or community groups.

Social Contacts with Friends

The NLTS asked parents to report how many days a week their children who were in secondary school typically got together with friends outside of school. Parents' responses ranged from "never" to "6 or 7 days per week." It is important to be aware that data obtained from parents regarding their children's friendships measure the frequency of contacts with friends, not the number of friends they had, nor the quality of their relationships.

The majority of secondary students with disabilities were socially connected, with 56% seeing friends one to five times per week (Table 5-7). One-third of students with disabilities saw friends more than five times per week. Students with emotional disturbances were the most likely to see friends very frequently. Previous NLTS research has found that students whose primary affiliation was with individual friends outside of school had lower engagement in school and had lower performance in school (Wagner, 1991; Wagner, Blackorby, and Hebbeler, 1993). Only 12% of students saw friends outside of school less often than once a week or never. The lack of social contact of these students appeared to be associated with greater physical impairment. Students with multiple handicaps, orthopedic impairments, mental retardation, or other health impairments were more likely to have limited social contacts than were students with disabilities overall.

We hypothesized that the relationship between the frequency of students' social contacts and postsecondary education would be negative. Socially less active youth, who also tended to perform better in school, would be more likely to pursue further education. In contrast, those who were socially more active, would be less likely to continue their education beyond high school. We also hypothesized that involvement with friends would have a positive relationship to employment and independent living outcomes. Having a network of friends with whom to interact provides students with opportunities to learn how to get along with others, skills important for successful employment and effective functioning in the community.

Table 5-8 suggests some weak support for these hypotheses. Students who were socially more active were less likely to go on to either academic or vocational postsecondary education, although only vocational postsecondary education results reached significance (11 percentage points; $p<.05$). For youth with sensory impairments, the hypothesis was confirmed for both academic and vocational postsecondary education (15 and 14 percentage points; $p<.10$ and $p<.05$

Table 5-7

VARIATIONS IN THE FREQUENCY OF SOCIAL CONTACTS AND GROUP MEMBERSHIP OF STUDENTS WITH DISABILITIES WHILE IN SCHOOL

	Percentage with Social Contacts:				
Disability Category	< 1/week	1-5/week	> 5/week	Percentage Belonging to Group	n
All conditions*	11.6	55.6	32.7	60.9	1,877
	(1.7)	(2.7)	(2.6)	(2.7)	
Learning disabled	6.2	56.3	37.4	67.4	275
	(2.0)	(4.1)	(4.0)	(4.0)	
Emotionally disturbed	12.9	55.1	32.0	55.3	135
	(4.1)	(6.1)	(5.7)	(6.4)	
Speech impaired	9.5	55.4	35.1	64.8	125
	(3.9)	(6.5)	(6.3)	(6.3)	
Mentally retarded	22.5	54.5	23.0	48.2	210
	(4.1)	(4.8)	(4.1)	(5.0)	
Visually impaired	16.3	59.3	24.4	71.0	246
	(3.5)	(4.7)	(4.1)	(4.4)	
Hard of hearing	13.8	58.8	27.3	57.9	223
	(3.4)	(4.9)	(4.4)	(5.0)	
Deaf	11.6	53.9	34.5	61.3	260
	(3.0)	(4.6)	(4.4)	(4.5)	
Orthopedically impaired	27.3	58.2	14.5	45.9	168
	(5.2)	(5.7)	(4.1)	(5.9)	
Other health impaired	21.4	63.1	15.5	47.0	110
	(6.2)	(7.2)	(5.4)	(7.7)	
Multiply handicapped	31.2	36.7	32.2	40.7	107
	(6.6)	(6.9)	(6.7)	(7.1)	

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* "All conditions" includes youth in each of the 11 federal special education disability categories. Percentages are reported separately only for categories with at least 25 youth.

Although employment estimates for the main model did not reach significance, the relationships were positive, as hypothesized. Table 5-8 shows that multivariate analysis by disability types for employment was positive for all groups and significant for youth with physical disabilities. Youth with physical impairments who were socially more involved with friends while in school were more likely to be employed as young adults (51 percentage points; p<.001) and to earn significantly more money ($2,450; p<.05) than students with physical disabilities who were not socially active. Students with mild and severe disabilities who saw friends frequently also earned significantly higher wages than students with those disabilities who saw friends less often ($1,682, p<.10, and $1,610, p<.05).

Table 5-8

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH FREQUENCY OF SEEING FRIENDS

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	-3.4	-4.3	-14.9 †	9.3	17.1
Postsecondary vocational education (percentage points)	-11.0 *	-.6	-13.5 *	-16.5	-.4
Competitive employment (percentage points)	6.1	10.9	2.5	51.0 ***	10.8
Total compensation (average dollars earned)	806	1,682 †	174	2,450 *	1,610 *
Independent living (percentage points)	6.8	1.0	.7	20.4	3.9
Profile A or B (percentage points)	8.2 *	6.1	-11.7 †	29.7 *	36.7 **
Profile E (percentage points)	4.2	2.8	13.3 **	-5.8	-4.0

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† p<.10; * p<.05; ** p<.01; *** p<.001

Comparisons are between youth who saw friends 6 or 7 days a week and those who saw friends once a week.

The frequency of seeing friends while in school was significantly associated with full community participation (8 percentage points; p<.05). Youth who had been active socially in school continued to be so as young adults. These relationships were particularly strong for youth with physical and severe disabilities. Youth with physical or severe disabilities who were socially active in high school were 30 and 37 percentage points more likely to be fully participating in their communities, respectively, than peers who were not as socially active in high school (p<.05 and p<.01). The pattern was different for youth in the sensory disabilities cluster. Contrary to expectations, youth with sensory impairments who had fewer social contacts while they were in high school were actually more likely to be full community participants later (12 percentage points; p<.10). Youth with these disabilities who were active socially while in school were more likely to be inactive in the community than those who had been less active socially in school (13 percentage points; p <.01).

Group Memberships

A more formalized dimension of social involvement for students in secondary school is participation in a school or community group. Participation in a group requires students to conform to the norms of the organization and reflects a commitment to the norms of the school and community. This type of social involvement is very different from spending time with friends outside of school. Participation in extracurricular school groups has been correlated with higher self esteem, increased student engagement, more expressed satisfaction with school, and an increased likelihood of school completion (Holland and Andre, 1987; Pittman and Haughwout, 1987). It is unclear whether group affiliation reflects the benefits of participation in the group or is an artifact of personality or social differences of the youth who choose to be involved in school or community groups. Nevertheless, previous NLTS research has found that students with disabilities who participated in school or community groups had lower rates of absenteeism, course failure, and dropping out of school (Wagner, Blackorby, and Hebbeler, 1993).

Parents were asked while their children were still in secondary school whether they belonged to any school or community groups in the year before the interview. Overall, 61% of youth with disabilities were members of school or community groups while they were in school. Variation in group participation by disability group ranged from 71% for youth who were visually impaired to 41% for youth with multiple handicaps. We hypothesized that participation in school and community groups while in secondary school would be likely to lead to more positive adult outcomes.

As predicted, Table 5-9 shows that youth who had participated in school and community groups while in school were more likely to attend academic postsecondary education, by a 21 percentage point difference ($p<.001$), with the relationship being particularly strong for mildly and sensorily impaired youth. However, postsecondary vocational school attendance was negatively associated with involvement in school groups (7 percentage points; $p<.10$), particularly for youth with physical disabilities (23 percentage points; $p<.01$). This may be due to a choice to enroll in academic rather than vocational postsecondary education programs.

Participation in extracurricular groups while in school did not lead to significant improvements in employment outcomes for youth with disabilities overall. In fact, the one significant relationship regarding employment was negative; youth with sensory impairments who had been group members in secondary school were estimated to earn $1,144 per year less than nonmembers with similar disabilities ($p<.05$).

School and community group participation appeared to contribute to residential independence. For youth with disabilities overall, participation in a school or community group was associated with an 8 percentage point higher probability of living independently ($p<.05$). This relationship was particularly strong for youth with physical impairments.

Table 5-9

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH STUDENTS BELONGING TO A SCHOOL/COMMUNITY GROUP

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	20.6 ***	13.4 **	25.4 ***	10.4	16.3
Postsecondary vocational education (percentage points)	-6.8 †	.3	-3.5	-22.9 **	-5.7
Competitive employment (percentage points)	1.8	4.8	-4.1	7.0	-15.3
Total compensation (average dollars earned)	235	1,166	-1,144 *	895	-840
Independent living (percentage points)	7.5 *	4.9	5.3	27.9 **	-2.7
Profile A or B (percentage points)	7.3 *	8.8 †	8.4	9.3	-8.5
Profile E (percentage points)	-5.2 *	-13.3 ***	.6	-15.2 †	7.5

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† p<.10; * p<.05; ** p<.01; *** p<.001

Comparisons are between youth who belonged to groups in secondary school and those who did not.

Group members also were more likely to be full community participants (7 percentage points; p<.05) and less likely to be inactive in their communities (5 percentage points; p<.05). Perhaps through earlier participation in groups, youth gained experience in formalized social interactions, developed a network of friends, and learned how their group fit in to the structure of the community. Conversely, students who lacked this type of experience were more likely to be inactive. In particular, youth with mild or physical disabilities who had been participants in school or community groups were 13 and 15 percentage points less likely than their peers who had not participated to be inactive in the various domains of adult life (p<.001 and p<.10). These benefits of group membership while students were in secondary school underscore the importance of schools' providing multiple opportunities for youth with varied interests and abilities to connect with social groups that can reinforce engagement in school and positive social behaviors.

These findings suggest that it is in part what a young person does, not just who that person is, that conditions his or her success in the early postschool years. Being the kind of person who attends to tasks, gets along, and connects with others in school or community groups contributes to good school performance; together, these traits, along with success in school, will stand a young person in good stead through adult life. These traits can be learned. To be learned, they must be taught, at home and at school. As with much other learning, it often is easier when it begins at an early age.

References

Holland, A., and Andre, T. (1987). Participation in extracurricular activities in secondary school: What is know, what needs to be known? *Review of Educational Research, 57,* 437-466.

Kaufman, P., and Bradby, D. (1992). *Characteristics of at-risk students in NELS:88.* Washington, DC: U.S. Department of Education.

Pittman, R. B., and Haughwout, P. (1987). Influence of high school size on dropout rate. *Educational Evaluation and Policy Analysis, 9*(4), 337-343.

Wagner, M. (1991). *Dropouts with disabilities: What do we know? What can we do?* Menlo Park, CA: SRI International.

Wagner, M., Blackorby, J., and Hebbeler, K. (1993). *Beyond the report card: The multiple dimensions of secondary school performance for students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

6 AS TIME GOES BY

The findings reported in the preceding chapters concern youth with disabilities who had been out of secondary school from a few months to 3 years. We have seen that the outcomes recorded for them were influenced by a variety of individual, household, and school program characteristics, as well as by the experiences of youth themselves in the social and academic arenas while they were in high school.

But these characteristics and experiences alone do not explain the variations in outcomes we see. Time itself can be a factor in what youth achieve after leaving high school. For example, a youth's first job right out of high school can provide experience that can be parlayed into job advancements with that employer or into offers for better jobs elsewhere. Enrollment in a postsecondary vocational training program soon after high school can provide skills for employment later. Age alone provides a perspective that can benefit youth as they settle into more adult roles and responsibilities.

In contrast, youth who leave school poorly prepared for employment or further schooling can flounder in a world that no longer is structured by the routine of school schedules. Adult services that might help in the transition of such youth to productive activities can have complex and variable eligibility requirements and long waiting lists. In the absence of a job, an education or training program, or services needed to connect with them, the passage of time after high school can mark a downward spiral in outcomes that may be increasingly difficult to reverse. In these ways, time can directly influence the outcomes of youth. It can give opportunities to develop and build positive experiences after leaving school, or it can plot the deterioration of the circumstances of youth with disabilities and their possibility for a successful transition.

The NLTS is interested in charting the path of youth with disabilities as they distance themselves in time from high school in order to understand these direct effects of time on the development of their postschool experiences. A second interest also guides analyses in this chapter. We are interested in learning whether the effects of schooling "hold up" as students age and as adult experiences accumulate. For example, are the benefits of high school vocational education that were identified in Chapter 4 equally powerful over the full 3 years that youth had been out of school? Or did exiters with vocational training reap the benefits of that training more in the first year after high school, when it helped them get their first postschool job, and less later, when the accumulated experience of postschool employment was more important in shaping their outcomes? The desire to understand these indirect influences of the passage of time also directs the analyses reported here.

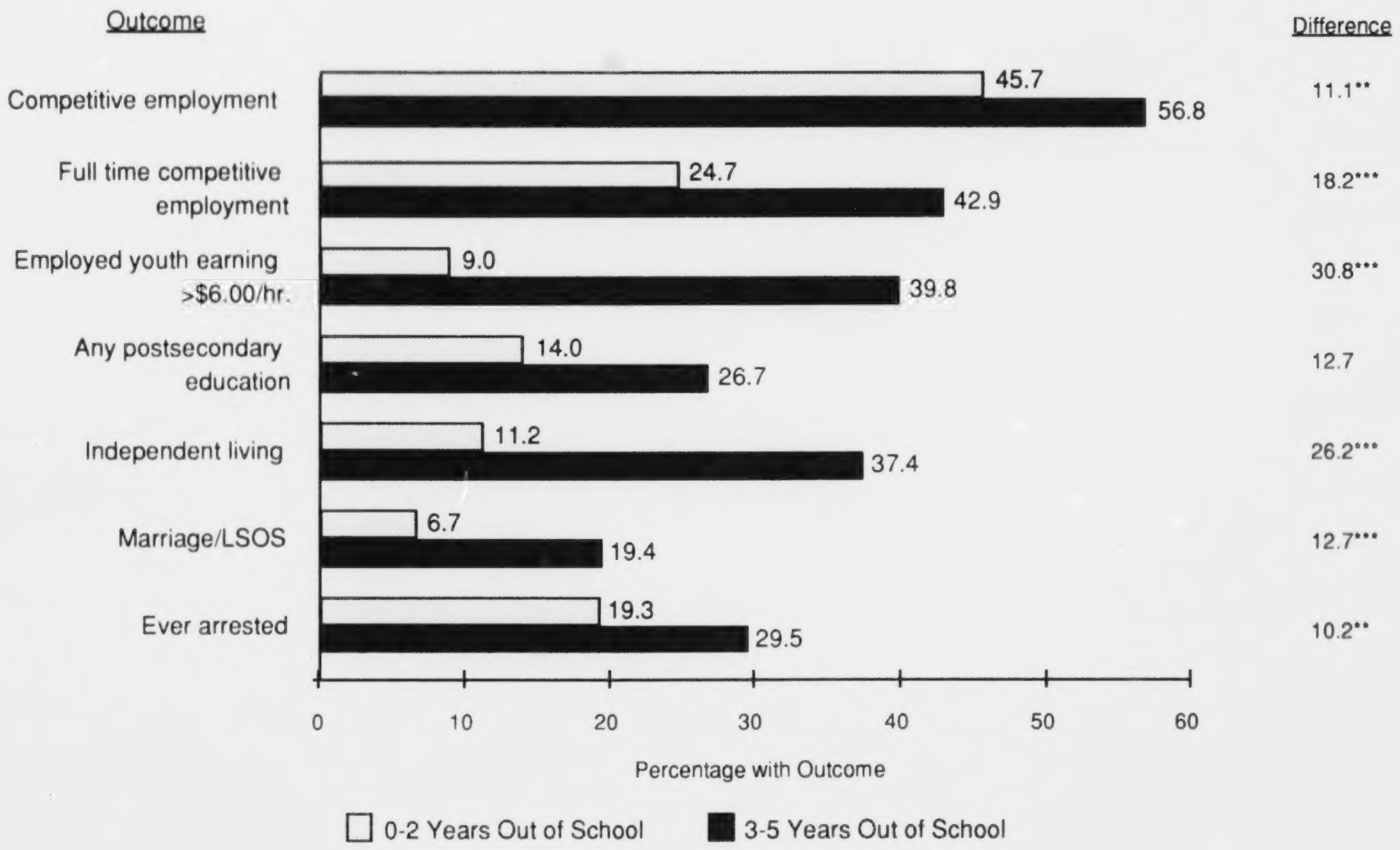
We have examined the importance of time in the postschool experiences of youth with disabilities in two ways. First, we have included in the multivariate analyses reported throughout this volume a variable indicating the number of years youth had been out of high school. Significant associations between this variable and postschool outcomes identify the direct influences of time, independent of the variety of other factors in the analyses, which were reported in the preceding chapters. A second analytic strategy assumes that time also interacts with other factors in the analyses, as the vocational education example above illustrates, changing the intensity of their influence on outcomes over time. To identify whether these interactions occur, and with which personal or school factors, we have conducted the multivariate analyses separately for youth out of school up to 1 year and for those out of school longer. Individual, household, and school factors that are stronger in one analysis than the other are interrelated with time, allowing us to identify indirect effects of time on outcomes.

Direct Influences of Time on Outcomes

Extensive NLTS analyses of trends in postschool outcomes (Wagner, D'Amico, Marder, Newman, and Blackorby, 1992) show their consistent improvement over time when outcomes of youth who had been out of secondary school up to 2 years were compared with outcomes for those same youth 3 years later. Figure 6-1 summarizes the extent of growth in such outcomes as competitive employment and postsecondary enrollment for this cohort of youth.

Table 6-1 confirms the importance of time for the present analytic cohort—youth with disabilities who had been out of secondary school up to 3 years. Independent of other differences between them, youth who had been out of school longer registered consistently more positive postschool outcomes than youth who had more recently left secondary school.

For example, youth who had been out of secondary school 3 years were significantly more likely to have enrolled in postsecondary education programs than youth out of school 1 year or less. Further, the influence of time was much stronger regarding enrollment in vocational programs (15 percentage points higher enrollment for later than for earlier exiters; $p<.001$) than in postsecondary academic programs (7 percentage points; $p<.10$). This suggests that most youth with disabilities who enrolled in 4-year colleges or 2-year college academic programs did so fairly soon after leaving high school, with only marginal, though significant, increases in succeeding years. In contrast, youth with disabilities increased their participation in postsecondary vocational programs significantly over time. Perhaps early experiences in the labor market pointed up the importance of continuing to upgrade job skills, leading them to pursue further vocational training after high school. Youth with sensory impairments experienced significant gains in enrollment over time (4 percentage points for academic programs and 12 percentage points for vocational programs; $p<.10$). Youth with physical impairments showed the greatest gains in vocational program enrollment, independent of other factors (56 percentage points higher by the third than the first year after leaving secondary school; $p<.01$).



** p < .01; *** p < .001

FIGURE 6-1 TRENDS OVER TIME IN POSTSCHOOL OUTCOMES OF YOUTH WITH DISABILITIES

Table 6-1

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES ASSOCIATED WITH YEARS OUT OF HIGH SCHOOL

		Youth with Disabilities			
	All Youth	Mild	Sensory	Physical	Severe
Postsecondary academic education (percentage points)	7.3 †	-2.9	3.5 †	6.6	15.7
Postsecondary vocational education (percentage points)	15.3 ***	3.0	11.5 †	55.9 **	6.3
Employment (percentage points)	8.6 †	7.8	8.9	25.0 †	3.2
Total compensation (average dollars earned)	1,300 **	2,467 **	1,230 *	1,248	-91
Independent living (percentage points)	13.7 ***	18.0 **	9.6	37.9 **	-1.9
Profile A or B (percentage points)	2.6	2.4	.9	2.7	-19.1 †
Profile E (percentage points)	-.5	-1.7	5.6	-11.4 †	17.5

Comparisons are between youth in their second or third year after high school and those in their first year after high school.

† p<.10; * p<.05; ** p<.01; *** p<.001

Employment outcomes also showed positive effects of time. Youth with disabilities who had been out of secondary school 2 to 3 years were estimated to have a competitive employment rate 9 percentage points higher than youth out of school up to 1 year (p<.10), holding constant other factors. Further, compensation from their work was estimated to be $1,300 higher (p<.01), indicating an improvement in the quality of the jobs they held or increasing compensation for the experience they brought to their jobs. However, these employment improvements were not shared by all youth. Those with severe disabilities showed no gains over time in either their rate of competitive employment or their wages if employed. In contrast, the employment rate improved by between 8 and 25 percentage points for other youth (p<.10 in the latter case), and wage increases ranged from $1,230 to almost $2,500 over the time period (p<.01 in the latter case).

Increasing residential independence also was attributable to longevity as a school exiter. Those out of school 2 to 3 years lived independently at a rate 14 percentage points higher than those out of school up to 1 year (p<.001). However, youth with severe disabilities again failed to share in this increase in positive outcomes. Gains in residential independence for other groups ranged from 10 percentage points for those with physical disabilities (not statistically significant) to 18 percentage points for those with mild disabilities and 38 percentage points for those with physical impairments ($p<.01$).

Given the significant influences of time on residential independence, as well as on postsecondary education enrollment and employment, it is surprising that the number of years out of school was not associated with increased general community participation for youth as a whole. Although the relationships are in the expected direction, being out of high school longer was not significantly related either to increasing the probability that youth were participating fully in their communities (Profile A or B) or to decreasing the rate of inactivity (Profile E). This result appears to be due to different clusters of youth experiencing movement in opposite directions in their levels of community participation. Small gains in participation for those with mild, sensory, or physical disabilities were offset by declines in full community participation of severely impaired youth (19 percentage points less by the third year than in the first year after high school; $p<.10$) and an increase in inactivity.

The Interrelationships of Time and Other Aspects of Youth and Their Experiences

Here we examine how the influences on postschool outcomes of individual, household, behavioral, and school factors might change over time as youth distance themselves in time from high school.

Disability-Related Factors

Significant differences between the postschool outcomes of youth with different primary disabilities, independent of other differences between them, were noted in Chapter 3. Generally, these differences were stable over time, with youth in most disability categories maintaining their same trajectory across outcomes when compared with youth with learning disabilities. Several exceptions are noted, however.

First, there was a marked increase over time in the earnings gap of workers in virtually all disability categories, compared with youth with learning disabilities. Table 6-2 demonstrates that, in the first year after high school, most categories of workers earned marginally less than youth with learning disabilities (from about \$500 to \$2,600 less), although differences generally were not statistically significant. However, gaps were much larger by the third year after leaving high school (from about \$2,100 to more than \$5,000) and significant for all categories of youth. Clearly, youth with learning disabilities were enjoying the most positive employment experiences of all categories of youth, independent of other factors, as measured by their total compensation.

Table 6-2

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES OVER TIME ASSOCIATED WITH DISABILITY CATEGORY

Disability Category and Years Out of School	Estimated Change in: Postsecondary Academics (Percentage Points)	Postsecondary Vocational (Percentage Points)	Employment (Percentage Points)	Total Compensation (Average dollars earned)	Independent Living (Percentage Points)	Profile A or B (Percentage Points)	Profile E (Percentage Points)
Emotionally disturbed							
Up to 1 year	-20.6	1.7	-21.6 *	-1,187	-3.4	-4.9	36.7 ***
2 or 3 years	-.1	-9.1	1.3	-2,111 *	-7.0	-13.8	6.1
Speech impaired							
Up to 1 year	13.9	-1.7	-18.6 †	-719	4.5	12.1	2.4
2 or 3 years	23.4 *	-5.6	4.6	-2,975 **	6.9	9.0	-.1
Mildly/moderately mentally retarded							
Up to 1 year	-12.6	-11.6 †	-9.8	-514	-1.3	2.1	13.1
2 or 3 years	-17.9	-15.7 **	-5.0	-2,860 **	-18.1 **	-24.2 **	12.3 *
Hard of hearing							
Up to 1 year	28.5 *	-3.9	-15.0	-1,692 †	-2.2	-10.5	4.6
2 or 3 years	25.9 **	3.0	-7.9	-3,686 ***	-1.9	-8.9	-8.3
Deaf							
Up to 1 year	32.6 **	5.1	-19.7 *	-1,926 *	8.3	2.8	3.0
2 or 3 years	23.6 **	3.0	-22.5 ***	-5,089 ***	-1.1	-.4	2.3
Visually impaired							
Up to 1 year	25.3 *	-6.9	-22.9 *	-1,590	16.6 †	11.7	3.5
2 or 3 years	37.3 ***	-.3	-19.3 **	-4,348 ***	-5.2	-4.0	-.1
Orthopedically impaired							
Up to 1 year	-4.2	-12.1 *	-31.2 ***	-2,600 **	-11.6	-33.6 **	40.9 ***
2 or 3 years	23.8 *	-1.4	-22.2 **	-4,804 ***	-13.8	-17.8 †	.1
Other health impaired							
Up to 1 year	11.9	-7.0	-10.5	-618	-8.8	-5.6	19.6 †
2 or 3 years	17.6 †	2.2	-8.3	-2,931 **	-13.3	-24.8 **	4.1
Severely impaired							
Up to 1 year	-11.1	-6.6	-21.9	-2,237	-3.2	-11.1	21.7 †
2 or 3 years	13.2	-14.5 †	-18.5 †	-4.225 ***	-9.8	-23.2 *	3.0

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† p < .10; * p < .05; ** p < .01;*** p < .001

In contrast, we see several categories of youth with disabilities "catching up" with their peers with learning disabilities regarding lack of involvement in the community (i.e., being characterized by Profile E). Whereas youth with serious emotional disturbances, or with orthopedic, other health, and severe disabilities all were significantly more likely to be inactive in the community in their first year after leaving secondary school, these differences largely disappeared in the subsequent 2 years.

Finally, there was a pattern of general deterioration in outcomes over time for youth with mental retardation and severe disabilities relative to youth with learning disabilities. For example, there were marginally greater gaps between youth with mental retardation and those with learning disabilities in the third year after high school than the first regarding postsecondary enrollment in academic and vocational programs, and sizable gaps emerged regarding independent living (from 1 percentage point less than youth with learning disabilities to 18 percentage points less independence; $p<.01$) and full community participation (from 2 percentage points greater than youth with learning disabilities to 24 percentage points less; $p<.001$). Declines in full community participation also were noted for youth with orthopedic impairments (from 6 to 25 percentage points less than youth with learning disabilities; $p<.01$) and those with severe disabilities (from 11 to 23 percentage points less than youth with learning disabilities; $p<.05$). The fact that youth with orthopedic and severe disabilities were less likely over time to be characterized by both profiles A/B and E compared with youth with learning disabilities means that these youth were increasingly characterized by profiles C or D, youth who were independent in a single domain, or active outside the home but not independent in any of the three dimensions involved in constructing the profiles.

Individual and Household Characteristics

Table 6-3 shows relatively stable relationships over time between many individual and household characteristics and several outcome measures. However, some changes in relationships are noted.

For example, although there were few large differences over time in the relationships between gender and most outcomes, a pattern of increasing benefits for males began to emerge. The gap in wages in the first year after leaving secondary school favored males by $1,272 ($p<.01$), independent of other factors, which grew to almost $2,000 for males out of school 2 to 3 years ($p<.001$). Also, males were marginally less likely than females to be attending academic education programs or to be fully participating in their communities in the first year after school, differences that reversed direction in the subsequent 2 years, although differences were small and not statistically significant. Consistent with the increasing benefits to males, being a mother had a growing negative influence on employment prospects for young women (from 6 percentage points lower employment than nonparents to 22 percentage points over time; $p<.001$). Independent living increased for mothers, presumably as they established households with the fathers of their children or with their children alone.

Table 6-3

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES OVER TIME ASSOCIATED WITH DEMOGRAPHIC CHARACTERISTICS

	Estimated Change in:							
Disability Category and Years Out of School	Postsecondary Academics (Percentage Points)	Postsecondary Vocational (Percentage Points)	Employment (Percentage Points)	Total Compensation (Average Dollars Earned)	Independent Living (Percentage Points)	Profile A or B (Percentage Points)	Profile E (Percentage Points)	For Increment
Gender								
Up to 1 year	-6.3	3.4	7.1	1,272 **	-8.1 †	-3.5	-.1	Male vs. female
2 or 3 years	3.6	-2.3	5.2	1,993 ***	-4.9	6.6	2.7	
Parenthood								
Up to 1 year	-26.1 †	-9.7	-5.8	138	24.7 *	10.6	.5	Being a parent vs. nonparent
2 or 3 years	-23.1 ***	-3.4	-21.6 ***	-73	37.1 ***	5.2	7.9	
African American							**	
Up to 1 year	-7.2	-8.2 †	-15.4 *	-496	-6.5	-13.8 †	18.0 **	African American vs. white
2 or 3 years	9.3	3.1	-7.2 *	-1,050	-9.7 †	-8.2	4.8	
Hispanic								
Up to 1 year	2.0	12.8 †	4.9	352	-12.3	-10.6	2.1	Hispanic vs. white
2 or 3 years	-2.7	5.1	.7	1	-23.0 **	-17.5 *	9.9 †	
Low income household								
Up to 1 year	-10.0 *	-1.9	-3.4	-482	-1.6	-10.1 *	7.0 †	Less than $12,000 vs. $38,000 to $50,000
2 or 3 years	-8.8 **	-4.0 †	-3.2	-784 *	-1.2	-3.9	4.3 †	
Single-parent household								
Up to 1 year	-5.4	-2.8	-.3	219	-7.5	-3.5	-.7	Single-parent vs. two-parent household
2 or 3 years	-9.3 †	-.8	6.8	-76	2.8	2.6	-1.8	
Parental expectations								
Up to 1 year	24.0 ***	4.4	-20.7	-2,226	6.9	42.9 **	-13.9	Expected positive vs. negative outcomes
2 or 3 years	36.8 ***	6.4	8.9	-586	15.4 *	31.2 ***	-11.5 †	

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† p < .10; * p < .05; ** p < .01; *** p < .001

The negative effects of being African American seemed to ameliorate with years out of school. For example, although African American youth were less likely than white peers to be enrolled in academic or postsecondary vocational programs in the first year after high school (7 and 8 percentage points; p<.10 for vocational programs), differences reversed in direction by the third year after high school. Gaps between African American and white youth also declined regarding employment and community participation (e.g., from 18 percentage points higher likelihood of no community involvement, p<.01, to 5 percentage points, not a significant difference). Hispanic youth did not show a similar pattern of "catching up" with the outcomes of white youth. In fact, gaps in independent living and full community participation actually increased (from 12 to 23 percentage points and from 11 to 18 percentage points, respectively; p<.01 and p<.05).

Being from a low-income or single-parent household generally had stable relationships to outcomes over time. However, we do note a marginal growth in the gap in postsecondary education enrollment between poor and wealthier youth. Gaps in enrollment in postsecondary academic programs were significant in the later years for youth from single-parent households (4 percentage points lower; p<.10) and in vocational program enrollment for youth from poorer households relative to their wealthier peers (9 percentage points lower; p<.10).

Parental expectations for positive outcomes for their children continued to be strong influences on those outcomes, irrespective of other differences between youth. In fact, for some outcomes, the influence of parental expectations increased with time, suggesting that children continued to strive to meet those expectations. For example, youth whose parents expected them to continue their educations after high school were even more likely to have done so by 3 years after leaving school than in the first year (e.g., 24 percentage points in year 1 for academic programs and 37 percentage points by year 3, p<.001). Similarly, youth whose parents expected them to live independently were even more likely to have met that expectation 2 to 3 years after high school than in the first year (15 percentage points by year 3 vs. 7 in year 1; p<.05). Significant influences of parental expecations on full community participation were maintained over time.

Secondary School Factors

In general, school program factors did not show a marked decline over time in their influence on postschool outcomes for youth with disabilities. In fact, the influence of some aspects of schooling were stronger in the later years than in the first year students left school.

The influence of secondary school vocational experiences on employment outcomes appeared to strengthen. For example, the gap in competitive employment rates between youth who had concentrated in a vocational content area in high school and youth who had taken only prevocational or no vocational education courses increased from 16 percentage points in the first year after high school to 31 percentage points later (p<.01). Wage differences also increased, from almost $1,800 (p<.10) to more than $2,700 (p<.01).

Vocational concentrators also were increasingly less likely than others to be characterized by Profile E as time went on (from 2 percentage points in the first year to 9 percentage points later; p<.10).

Differences in employment rates between students who took vocational survey courses and those who took prevocational or no vocational education were similar in direction, though smaller than those of vocational concentrators. Unlike vocational concentrators, those who took survey courses did not experience significant wage advances over time. Participating in work experience did not have particularly strong relationships to outcomes at either point in time. In fact, work experience participants lost their wage advantage over nonparticipants as time passed.

Factors related to youths' academic programs, including placement and participation in college preparatory courses, had stable relationships with outcomes, with the exception of an increasing wage advantage and a higher likelihood over time of full community participation for students who had spent more time in regular education courses. Attending a school with a larger proportion of poor students was not strongly related to outcomes other than postsecondary education program enrollment, for which influences were stronger in the first than in later years after high school.

Attending a special school was shown in Chapter 4 to have a positive relationship to independent living. Table 6-4 suggests that virtually all of that effect was realized in the later years after leaving school, when the gap in independent living between special and regular school students was 27 percentage points favoring special school students (p<.01), independent of other factors. Disadvantages in postsecondary academic program enrollment and in full community participation also reversed over time, although differences were not statistically significant.

In contrast to the stable or increasingly strong relationships between outcomes and several school program factors, aspects of students' behaviors or choices in high school generally weakened over time in their relationship to postschool outcomes. For example, the negative effects of dropping out on employment declined from a 17 percentage point disadvantage relative to graduates or those who aged out in the first year after high school (p<.10) to virtually no difference 2 years later. Similarly, the disadvantage of dropouts in reaching full community participation declined from 30 to 18 percentage points. Consistent with this, the likelihood of dropouts' being nonparticipants in their communities declined from a 19 percentage point difference in the first year after high school to only 4 percentage points difference later.

Table 6-4

ESTIMATED CHANGE IN POSTSCHOOL OUTCOMES OVER TIME ASSOCIATED WITH SECONDARY SCHOOL EXPERIENCES

	Estimated Change in:							
Disability Category and Years Out of School	Postsecondary Academics (Percentage Points)	Postsecondary Vocational (Percentage Points)	Employment (Percentage Points)	Total Compensation (Average Dollars Earned)	Independent Living (Percentage Points)	Profile A or B (Percentage Points)	Profile E (Percentage Points)	For Increment
Attended special school								
Up to 1 year	-19.3 †	-5.4	-6.1	225	.3	-16.7	15.3	Attended special vs. regular school
2 or 3 years	8.1	4.1	-9.4	663	26.7 **	14.0	3.7	
Concentrated in vocational education								
Up to 1 year	-2.2	13.2	16.5	1,787 †	-1.2	22.5 †	-1.9	Concentrating vs. taking pre- or no vccational education
2 or 3 years	-4.7	8.7	30.6 **	2,708 **	-8.7	5.1	-8.7 † **	
Took survey vocational courses								
Up to 1 year	10.4	10.6	21.1 †	1,437	.0	27.9 *	-4.7	Taking survey vs. pre- or no vocational education
2 or 3 years	12.	8.2	24.6 **	1,509	-8.5	5.9	-7.5	
Percent class time in regular education								
Up to 1 year	2.5	-1.3	14.5 *	1,269 *	1.9	5.9	-.4	100% vs. 50%
2 or 3 years	4.5	4.2	6.9	1,538 **	7.2	16.1 ***	-4.5 †	
Took college prep courses								
Up to 1 year	28.7 ***	-6.2	-9.3	-1,178 †	16.4 *	15.2 †	-8.7	Took advanced courses vs. no such courses
2 or 3 years	20.3 ***	-5.1	1.8	-607	18.0 ***	13.2 *	-7.1 †	
Dropped out of school								
Up to 1 year	-9.6	--	-16.8 †	-654	15.3	-30.3 **	19.0 *	Dropped out vs. graduated or aged out
2 or 3 years	-11.4	--	.7	-260	-10.1	-17.9 **	4.4	
Frequency saw friends outside of school								
Up to 1 year	-9.9	-13.4 **	13.3 †	1,939 **	3.4	1.9	6.5	Once or twice weekly vs. 6 or more times weekly
2 or 3 years	.0	-5.1	8.7	486	7.8	12.1 *	2.8	
Had school-sponsored work experience								
Up to 1 year	-3.4	-1.8	4.3	1,454 *	1.7	.7	4.3	Had experience vs. no experience
2 or 3 years	-11.8 *	5.8	3.2	542	8.1	5.3	-3.0	
Belonged to school/community group								
Up to 1 year	27.7 ***	.2	.9	-43	13.3 †	3.2	-11.4 *	Member vs. nonmember
2 or 3 years	18.5 ***	-6.0 †	-3.9	-379	3.9	9.1 *	-4.0	
Low income student body								
Up to 1 year	13.9 *	6.6 †	-7.9	-202	3.2	5.2	-6.9	
2 or 3 years	5.4	3.3	-1.8	123	-3.7	,0	1.6 †	

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† p < .10; * p < .05; ** p < .01; *** p < .001

Similar decreases in the magnitude of relationships are noted between the frequency of seeing friends and postsecondary education and employment outcomes. For example, the earnings gap between those who saw friends frequently and others was almost $2,000 in the first year after high school, but it had declined to less than $500 2 years later. Belonging to a school or community group while in high school also generally was less strongly related to outcomes in later years, particularly regarding independent living and being nonparticipants in the community.

These analyses demonstrate a complex relationship between time and outcomes, with some youth and some outcomes showing positive effects of the passage of time, and others showing stable or deteriorating effects over time when other differences between youth are controlled statistically. This complexity points up the importance of regular monitoring of the outcomes of youth as time passes because the direction and magnitude of changes in outcomes we observe in the early postschool years cannot be assumed to indicate the continued evolution of outcomes as youth age further.

Reference

Wagner, M., D'Amico, R., Marder, C., Newman, L., and Blackorby, J. (1992). *What happens next? Trends in postschool outcomes of youth with disabilities. The second comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

7 CHALLENGES TO MEET, CHOICES TO MAKE

On the path to adult life, young people with disabilities faced many of the same issues that confront all adolescents and young adults at their developmental stage. The demands of "growing up" for a particular youth were further shaped by his or her gender, ethnic or cultural background, and family characteristics and experiences. Added to these formative factors were the particular challenges associated with disabilities. The combination of these characteristics did much to shape the early adult experiences of youth with disabilities.

However, the findings reported here demonstrate that choices made by or for youth with disabilities in their secondary school years also played an important role in determining the path they take in early adulthood. Youth with disabilities, their families, and the professionals who served them did influence the success youth experienced when they left school.

Here we synthesize the findings regarding the important influences on the early postschool outcomes of youth with disabilities. We first summarize key findings regarding the influences of individual and household, school, and behavioral factors on postschool outcomes, and then go beyond this summary to consider the cumulative effects of various factors in shaping the early adult outcomes of young people with disabilities. The chapter concludes with a focus on particular groups of youth who share clusters of disabilities and summarizes the pattern of influences on their particular paths to early adulthood.

The Influence of Individual and Household Characteristics on Postschool Outcomes

Among the factors examined by the NLTS, the kind of disability youth had was one of the most significant influences on the paths they took after secondary school. Having a sensory impairment rather than a learning disability, for example, dramatically increased the likelihood that youth would enroll in a 2-year or 4-year college after high school (25 to 35 percentage points greater probability) rather than take a job (11 to 22 percentage points lower probability), independent of other differences between youth. Similarly, having mental retardation rather than a learning disability significantly increased the probability that youth would be inactive in their communities (13 percentage points) and decreased the probability of living independently in the early years after high school (14 percentage points).

Despite the powerful influence of disability, other individual and household characteristics also significantly shaped youths' postschool experiences. We have seen that being a minority or from a low-income or single-parent household each adversely affected a variety of outcomes. However, we also know that aspects of individuals and households often cluster together. Among youth with disabilities, 58% of minority youth also came from single-parent households; 53% also came from poor households. Almost two-thirds of single-parent households also were poor. The independent effects of each of these factors understate the negative consequences of their combination. A clearer picture of the challenge posed by economic disadvantage is seen in examining the cumulative effects on outcomes of being a minority youth from a poor, single-parent household.

Table 7-1 illustrates the difference in estimated postschool outcomes between two hypothetical young men with learning disabilities who had been out of school 2 years, who had average skill levels for their disability group, and who had had the same, average high school experiences. Their only differences were that one youth (column A) was white and from a two-parent family with a household income between $38,000 and $50,000 per year in 1987. This youth also had parents who reported they "definitely" expected that he would attend postsecondary school, find a job, and live independently in the future. The second youth, similar on all other characteristics in our analysis, was African American and from a single-parent household with an income between $12,000 and $24,999 per year, the income level of one-third of youth with disabilities. This youth had a parent who believed he "probably wouldn't" go on to school after high school, but "probably would" find a job and live independently.

The poor minority youth from a single-parent household had markedly lower outcomes on all dimensions we investigated. Whereas the white, wealthier youth with parents who expected more of him had a probability of attending college of 43%, the contrasting minority youth had a probability of postsecondary academic training of only 9%, a 34 percentage point difference. The more advantaged youth was 16 percentage points more likely to go on vocational school and 11 percentage points more likely to live independently than his disadvantaged counterpart. Differences in employment outcomes were smaller, but still favored the white youth from a more advantaged background. With the additional training he was more likely to get from postsecondary education, the financial prospects for the advantaged youth in the long term outweighed those of the disadvantaged youth to whom he is compared. Dramatic differences in community participation also were evident. The more advantaged youth had a very high probability of full participation (Profile A or B, 82%); the disadvantaged youth was 25 percentage points less likely to be fully participating in his community and 18 percentage points more likely to be inactive (Profile E). Clearly, economic disadvantage, in its multiple dimensions, was a powerful obstacle to youth with disabilities' achieving a successful transition out of high school to adult independence, an obstacle whose influence on outcomes did not systematically ease as time passed after high school.

Table 7-1

ESTIMATED POSTSCHOOL OUTCOMES FOR YOUTH WHO WERE SIMILAR EXCEPT FOR DIFFERENT DEMOGRAPHIC CHARACTERISTICS

	Estimated Probabilities of Outcomes for Youth Who Were*:		
	A	B	
Postschool Outcomes	White, from a 2-parent household earning $38,000 to $50,000 and having high parental expectations	African American, from a single-parent household earning $12,000 to $24,999 with moderate parental expectations	Difference Between Columns B and A
Postsecondary academic education (percentage points)	42.7	9.0	-33.7
Postsecondary vocational education (percentage points)	49.0	32.7	-16.3
Competitive employment (percentage points)	75.5	59.9	-15.6
Total compensation (average dollars earned)	9,027	7,374	-1,653
Independent living (percentage points)	45.5	34.5	-11.0
Profile A or B (percentage points)	82.2	56.9	-25.3
Profile E (percentage points)	9.5	27.7	18.2

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* Youth were males with learning disabilities out of school 2 years, with average values on other variables in multivariate analyses. They differed only in ethnic background, household income, household composition, and parent expectations, as indicated.

School Programs Made a Difference

Many of the characteristics noted above are beyond the control or influence of youth with disabilities, their families, or the educators or professionals who support them. Yet these immutable characteristics are not the whole story. Even when disability type or economic disadvantage present particularly imposing obstacles, choices regarding schools and school programs can improve the odds of achieving better postschool outcomes for young people with disabilities.

Examples of positive school programs that might benefit youth with disabilities can be illustrated with another set of hypothetical youth. This time they shared the same individual and household characteristics. Again, they were young males with learning disabilities who were out of school 2 years and had average skills for their disability category. They both were white and from two-parent households with incomes of $25,000 to $38,000 per year. All other factors were average for youth with disabilities, except the school programs they chose.

While our first hypothetical youth was in high school, he had a transition goal of finding competitive employment after graduation. In preparation, he took a concentration of high school vocational training that included a work experience component. He chose not to take advanced mathematics or foreign language, "college prep" courses that were not compatible with his transition goal. Yet he spent an average amount of time in regular education courses for students with disabilities because his vocational training was in a regular education setting. This combination of vocational experiences in high school was demonstrated by the NLTS to reduce significantly the likelihood that youth would drop out of school (Wagner, Blackorby, and Hebbeler, 1993); our first hypothetical youth successfully completed high school and faced his future with solid vocational training.

This vocational emphasis contrasts with the school program choices made by our second hypothetical youth with a learning disability, who chose a more academic program. This young man had a goal of postsecondary education. In preparation, he took advanced math in high school, receiving tutoring help with it in his one special education class; six of his seven courses were in regular education classes. This young man, too, had a program that meshed with his postschool goal. He pursued the program successfully and graduated from high school.

A third hypothetical youth, a "statistical twin" to the first two, was not so successful in high school. He spent an average amount of time in regular education classes but "dabbled" with his elective courses. He did not experience the "holding power" of vocational education or the skill-building benefits of work experience. Neither did he take on the challenges of college preparatory courses. Experiencing the course failure common to many students with disabilities, he began to fall behind his peers in earning the credits needed to graduate and eventually dropped out of high school, without solid vocational training to take with him into the labor market.

Table 7-2 illustrates the estimated postschool outcomes for these three youth. We see that the first two youth, who chose vocational and academic school programs, differed in the combination of outcomes they achieved in the early years after high school, differences that reflected their program choices. Our first youth (column A) was quite likely to obtain postsecondary vocational training (55% probability) and to find a competitive job (78% probability) that earned him relatively more than his two peers ($10,141). In contrast, the second youth, with his academic orientation, was considerably more likely than the others to enroll in an academic program after high school. Although his probability of academic

Table 7-2

ESTIMATED POSTSCHOOL OUTCOMES FOR YOUTH WHO WERE SIMILAR EXCEPT FOR DIFFERENT SCHOOL PROGRAMS

	Estimated Probability of Outcomes for Youth Whose School Experience Included*:			Difference Between:	
	A	B	C		
Postschool Outcomes	Regular school, 5 of 7 classes in regular education, concentrated in vocational education with work experience; graduated	Regular school, 6 of 7 classes in regular education, prevocational education only, advanced math or foreign language; graduated	Regular school, 6 of 7 classes in regular education, prevocational education only; dropped out	Columns C and A	Columns C and B
Postsecondary academic education (percentage points)	13.6	38.7	11.1	-2.5	-27.6
Postsecondary vocational education (percentage points)	54.8	29.0	21.9	-32.9	-7.9
Competitive employment (percentage points)	77.8	71.3	55.9	-21.9	-15.4
Total compensation (average dollars earned)	10,141	8,749	6,725	-3,416	-2,024
Independent living (percentage points)	37.1	57.8	33.5	-3.6	-24.3
Profile A or B (percentage points)	77.4	82.9	44.9	-32.5	-38.0
Profile E (percentage points)	11.1	8.3	24.9	13.8	16.6

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* Youth were white males with learning disabilities out of school 2 years, from moderate-income, two-parent households, with average values on variables in the analyses other than those indicated in the table.

training was still only 39%, one should keep in mind that the actual rate of college enrollment for youth with learning disabilities in the first 3 years after high school was only 19%. The academic emphasis of this youth's secondary school program doubled the probability of his pursuing further academic training. This youth also was very likely to have a competitive job (71% probability), and was the most likely of all three to live independently (58% probability), because of the higher likelihood of living in a college dormitory. Both graduates had very high probabilities of being full community participants (77% and 83%, respectively) and little chance of inactivity (11% and 8%).

In contrast, on all dimensions, the third youth experienced more negative outcomes than the first two. Lower probabilities of both academic and vocational training were found for this school dropout, as well as lower probabilities of employment and residential independence. These predictions of poorer outcomes combined to create a much lower probability that the third youth would fully participate in his community (32 and 38 percentage points lower). Hand in hand with this lower probability of full participation was a much higher likelihood of inactivity (14 and 17 percentage points). These striking differences underscore the importance of the choices made by and for youth regarding both course-taking in secondary school and school completion, particularly in light of the fact that school factors maintained the strength of their influence on outcomes as time passed after high school.

The Postschool Influences of Extracurricular Experiences in Secondary School

A student's school program is not the only arena in which choices can be made that can benefit the postschool outcomes of youth with disabilities. Analyses in Chapter 5 demonstrate that extracurricular experiences and student performance during secondary school can help shape later outcomes. Youth who saw friends very often outside of school had a pattern of poorer outcomes while in secondary school, including a significantly higher likelihood of dropping out (Wagner, Blackorby, and Hebbeler, 1993). Further, seeing friends often did little to benefit youth in their early postschool years, as shown in Chapter 5. In contrast, youth who belonged to school or community groups during high school were more connected to school, did better in school, and were much less likely to drop out (Wagner, Blackorby, and Hebbeler, 1993). These same youth experienced a significantly higher probability of postsecondary academic enrollment, residential independence, and full community participation than nonmembers.

Again, these independent relationships tend to understate the importance of this dimension of student behavior and performance in shaping postschool outcomes. Group members generally saw friends less and graduated more; the combination of those positive experiences led to quite different life paths. Table 7-3 illustrates the cumulative effect of this aspect of youths' experiences by contrasting another two hypothetical youth. Again, they were young white males with learning disabilities and the other individual and household characteristics noted previously. They had the same school programs that were average for youth with disabilities, differing only in their social activities and school completion status.

The combined benefits of group membership, moderate socializing with friends outside of school, and the accompanying higher likelihood of completing school created markedly different postschool outcomes for youth with those characteristics (column A) than those of youth who were otherwise similar but who saw friends outside of school almost daily, did not belong to a group during high school, and continued that disengagement from school by dropping out (column B). The most notable differences in the experiences of these

Table 7-3

ESTIMATED POSTSCHOOL OUTCOMES FOR YOUTH WHO WERE SIMILAR EXCEPT FOR DIFFERENT STUDENT BEHAVIORS

	Estimated Probabilities of Outcomes for Youth Who*		
	A	B	
Postschool Outcomes	Graduated, belonged to a school or community group, and saw friends 3 times per week outside of school	Dropped out, belonged to no school or community group, and saw friends 6 times per week outside of school	Difference Between Columns B and A
Postsecondary academic education (percentage points)	32.7	8.1	-24.6
Postsecondary vocational education (percentage points)	50.7	31.4	-19.3
Competitive employment (percentage points)	84.2	81.1	-3.1
Total compensation (average dollars earned)	9,631	8,976	-654
Independent living (percentage points)	30.0	24.3	-5.7
Profile A or B (percentage points)	76.6	57.2	-19.4
Profile E (percentage points)	9.3	24.4	15.1

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* Youth were white males with learning disabilities from moderate-income two-parent households, with average values on variables in the model other than those indicated.

hypothetical youth related to the likelihood that they would pursue postsecondary education, with its attendant contribution to long-term outcomes. The disengaged youth was 25 percentage points less likely to enroll in a postsecondary academic program and 19 percentage points less likely to pursue further vocational training. Although employment prospects were affected less by the social dimensions of youths' experiences, community participation was significantly related to them. Youth who were disengaged during high school were much less likely to be full community participants after high school (19 percentage points difference) and much more likely to be inactive in their communities (15 percentage points).

Putting It All Together

Just as each of these dimensions of youths' experiences include factors that clustered together, with accompanying cumulative effects on postschool outcomes, the clusters of factors also were related. Economically disadvantaged youth were more likely to be disengaged from school and to drop out of school. The resource-poor schools they often attended may have offered programs less suited to their transition goals. The negative effects of combining factors on the individual, school, and behavioral dimensions created situations in which some youth with disabilities, in a sense, had three strikes against them with regard to the paths they took into adulthood.

Table 7-4 illustrates this scenario for our hypothetical learning disabled males with average abilities. Column C demonstrates the estimated probability of various postschool outcomes for an economically disadvantaged minority youth whose parents had only moderate expectations of him for his future. His program in secondary school was not marked by any particularly beneficial thrust, he was socially disengaged from school, and eventually he dropped out. We see that his most probable life path was to be inactive in his community (49% probability). It was highly unlikely that he would upgrade his skills with any postsecondary education that would change that direction in the future. Significantly reduced chances of finding employment or earning an adequate wage meant little opportunity for residential independence (33% probability). Continued economic disadvantage in the future was probable.

In contrast, two youth with similar disability characteristics but no economic disadvantage, and with higher parent expectations and different school programs and behavioral experiences, demonstrated quite positive life prospects for their postschool years. The first youth (column A) had chosen a vocational emphasis for his secondary school program, was socially engaged in school, and graduated. He had better than a 50-50 probability of continuing his vocational training and quite a high probability of working competitively (80%), with higher earnings than his peers of similar disability characteristics, gender, etc. His counterpart with an academic focus to his school program was likely to achieve his goal of postsecondary academic training (60% probability), as well as to work competitively and live independently (74% and 65% probabilities). Full community participation was highly likely for both youth (81% and 86%), with correspondingly low chances of inactivity (7% and 5%).

In an earlier report from the NLTS on the experiences and outcomes of youth with disabilities (Wagner et al., 1991), the "mixed bag" of experiences we chronicled were likened to a glass that was at once half empty and half full. The analyses reported here suggest that the glass of postschool outcomes was considerably less than half full for some youth with disabilities—youth facing not only the challenges of disability, but economic disadvantage, poor school programs, and negative behaviors and performance while in secondary school. In contrast, a much fuller glass resulted for youth who did not face the limitations of economic disadvantage and whose choices regarding school programs, behaviors, and performance were more positive.

Table 7-4

ESTIMATED POSTSCHOOL OUTCOMES FOR YOUTH WHO DIFFERED IN DEMOGRAPHIC CHARACTERISTICS, SCHOOL PROGRAMS, AND STUDENT BEHAVIORS

	Estimated Probability of Outcomes for Youth Who Were*:			Difference Between:	
	A	B	C		
Postschool Outcomes	White, from a 2-parent household with moderate income, high parental expectations, prosocial behaviors, and strong vocational program	White, 2-parent household with moderate income, high parental expectations, prosocial behaviors, and strong academic program	African American, single-parent low-income household, moderate parental expectations, fewer prosocial behaviors, and unfocused secondary school program	Columns C and A	Columns C and B
Postsecondary academic education (percentage points)	27.2	60.0	2.6	-24.6	-57.4
Postsecondary vocational education (percentage points)	57.4	31.3	16.5	-40.9	-14.8
Competitive employment (percentage points)	79.6	73.5	34.7	-44.9	-38.8
Total compensation (average dollars earned)	10,447	8,882	5,092	-5,455	-3,790
Independent living (percentage points)	44.5	65.0	33.0	-11.5	-32.0
Profile A or B (percentage points)	80.6	85.5	26.2	-54.4	-59.3
Profile E (percentage points)	6.9	5.1	49.4	42.5	44.4

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* Youth were males with learning disabilities who had average values on all variables in the analyses, other than those indicated in the table.

No One "Right Answer": The Different Influences on Outcomes for Youth with Different Kinds of Disabilities

The multivariate analyses included in this report assessed relationships between a variety of independent variables and several postschool outcomes for youth with disabilities as a group. We also conducted analyses for four clusters of youth that were formed on the basis of the youths' disabilities. The "mildly impaired" cluster of youth included those who were classified as having learning disabilities, speech impairments, serious emotional disturbances, or mild mental retardation. Youth in the "sensory disabilities" cluster were those classified as hard of hearing, visually impaired, or deaf. The "physical disabilities" cluster included youth with orthopedic and other health impairments. Those in the "severe disabilities" cluster were those with deaf/blindness, multiple disabilities, or moderate or severe mental retardation. Key results for each cluster of youth are summarized below.

Youth with Mild Impairments

Youth with this cluster of disabilities emphasized competitive employment in setting transition goals for their postschool years (Cameto, 1993). They were the youth most likely to have achieved that goal, as well as to have achieved full community participation. Yet employment prospects for these youth were particularly sensitive to skill levels. Having higher self-care and functional mental skills was a strong advantage for mildly impaired youth in seeking employment, an advantage that was less apparent for high-functioning youth with other clusters of disabilities.

Youth with this cluster of disabilities experienced some of the strongest limiting impacts of some demographic characteristics, particularly gender. Among these youth, young women earned significantly less than men, a relationship that either was not noted or was less strong for other clusters of youth. Motherhood also had a powerful negative effect on employment outcomes for these youth, independent of other differences between them, an impact not seen for women with other kinds of disabilities.

They also were the group that reaped the greatest benefits of vocational training in high school in achieving their employment goals. For example, youth with this cluster of disabilities who took either a concentration of vocational education or survey courses in specific occupational areas during high school were between 26 and 40 percentage points more likely to find competitive employment than were youth who had not had this kind of vocational training, independent of other differences between them. Their earnings were between $4,000 and $6,000 higher than those of nonvocational students who were similar in disability and all other factors included in the analysis. This group of youth also showed the largest earnings gains over time.

However, some of these youth also sought further academic or vocational training after high school. Taking advanced high school courses and spending more time in regular education were beneficial in achieving these goals. For example, mildly impaired youth who had taken college preparatory courses in high school were 27 percentage points more likely to go on to a postsecondary academic program than were students with similar characteristics who had not had that kind of academic preparation. Similarly, students who spent all of their time in regular education were 10 percentage points more likely than students who spent half their time there to go on to postsecondary vocational training. These academic aspects of students' school programs had little impact on the employment or independent living outcomes of youth with mild impairments, however.

Youth with Sensory Impairments

Youth with hearing or visual impairments were more likely than other youth to have postsecondary education as a transition goal for their early postschool years (Cameto, 1993) and were the group mostly likely to have achieved that goal. More than half of youth with visual impairments, more than one-third of those who were hard of hearing, and 28% of those who were deaf had enrolled in a postsecondary academic program within their first 3 years out of high school. Between 15% and 20% had enrolled in a postsecondary vocational education program.

The self-care and functional mental skills level of youth with sensory impairments had little influence, independent of other factors, on the likelihood of their meeting their postsecondary education goal or other postschool outcomes; higher skills did not translate into a higher likelihood of enrollment. Yet youth with sensory impairments were about as likely as other youth to experience the limiting impacts of minority backgrounds, economic disadvantage, and parenthood. For example, young women with sensory impairments who were mothers were 29 percentage points less likely than males or nonparenting females to enroll in postsecondary academic programs; youth with sensory impairments from low-income backgrounds were 13 percentage points less likely to do so than their wealthier peers with similar disabilities to enroll in postsecondary academic programs. High parental expectations, however, were a powerful influence in raising the probabilities of postsecondary education and full community participation, independent of the effects of poverty, ethnic background, being a parent, or other factors controlled in the analyses.

Regarding the relationship of school factors to postschool outcomes, youth with sensory impairments, particularly youth who were deaf, were more likely than many other categories of youth to have attended special schools serving only youth with disabilities during their secondary school years. Independent of other factors controlled in NLTS analyses, attending special schools made no significant contribution to the postschool outcomes of youth with sensory impairments. In contrast, spending time in regular education courses did bring benefits to youth, but only in the employment arena. Youth with sensory disabilities who spent all of their time in regular education were estimated to be 15 percentage points more likely to be competitively employed and to earn about $1,500 more annually than youth with similar disabilities who spent half of their time in regular education. Planning for postsecondary education by taking college preparatory courses in high school significantly benefited youth with sensory disabilities, but, somewhat surprisingly, the benefits were not in the area of postsecondary education. Rather, youth who took college preparatory courses in high school were significantly more likely than those who didn't to live independently and to be fully participating in their communities. The influence on postsecondary education was positive (19 percentage points greater likelihood), but not statistically significant. No significant employment or other benefits accrued to youth with sensory disabilities from taking a concentration of vocational education or vocational survey courses or from work experience during high school.

Youth with sensory disabilities experienced some of the same effects of behavioral factors that were noted for youth with disabilities as a whole. Those who dropped out were significantly less likely than others to be full community participants. Those who saw friends frequently outside of school during their high school years were significantly less likely than others to go on to either academic or vocational postsecondary education or to participate fully in their communities and were significantly more likely to be inactive. However, belonging to school or community groups during high school did not result in the significant benefits for this group that it did for some others.

Youth with Physical Disabilities

The youth with orthopedic or other health impairments that comprised this cluster had among the poorest postschool outcomes of any disability groups. Compared with youth with learning disabilities, for example, those with orthopedic impairments were the least likely youth to be competitively employed or fully participating in their communities, and they earned the least amount of money, independent of other factors included in the analyses. Although their initial rates of residential independence were low, the passage of time worked in their favor. Youth with this cluster of disabilities who had been out of school 3 years were estimated to be 38 percentage points more likely to be living independently than similar youth who were in their first year out of school.

This group demonstrated some particularly puzzling findings regarding the influence on postschool outcomes of individual and household characteristics. For example, those with physical disabilities who had higher self-care skills actually were less likely to go on to postsecondary vocational training, to find jobs, or to participate fully in their communities than were lower-functioning youth with this cluster of disabilities. Higher functional mental skills also were negatively related to the likelihood of living independently.

In addition to the challenges of these disabilities, youth in this cluster who also were African American had significantly lower probabilities of enrolling in postsecondary academic programs (27 percentage points) or fully participating in their communities (29 percentage points) than white youth. However, being Hispanic with a physical disability actually seemed advantageous in the employment arena. These youth were estimated to be 50 percentage points more likely to be employed and to earn $3,000 more than white youth with similar disabilities and other characteristics. Yet the likelihood of fully participating in the community did not show a similar positive relationship to being Hispanic. Also, contrary to expectations, mothers with physical disabilities were significantly more likely than nonparenting youth with this cluster of disabilities to enroll in postsecondary academic programs.

This unusual pattern of relationships may result from the wide diversity of disabilities and abilities included in this cluster. An asthmatic youth, classified as other health impaired, for example, might have missed a lot of school, and done poorly there as a consequence (Wagner, Blackorby, and Hebbeler, 1993). This youth would demonstrate high functional mental and self-care skills but might be poorly prepared for employment or other adult roles. This youth also would not be eligible for many forms of adult services that could be available to youth with other kinds of physical disabilities. In contrast, the cluster also included youth with cerebral palsy, and other orthopedic impairments who might well have received adult services and assistive technologies that would assist them to adapt to employment or to obtain postsecondary education.

Youth with this cluster of physical disabilities were the most strongly influenced by parental expectations of any category of youth. For example, those whose parents had high expectations for them to go on to college did so at a rate 37 percentage points higher than youth with physical impairments whose parents did not have such an expectation. Similarly, higher parent expectations were associated with a 70 percentage point higher likelihood of youths' fully participating in their communities.

Regarding the relationships of school factors to postschool outcomes, youth with physical impairments were the only cluster to show significant negative effects of attending high-poverty schools. With personal household income controlled, attending a high-poverty school was related to a 45 percentage point lower probability that youth with physical disabilities would become full community participants. In contrast, these youth experienced among the strongest benefits of regular education. For example, independent of functional skills and other factors in the analysis, youth with physical disabilities who spent all of their time in regular education were 43 percentage points more likely to be competitively employed, 41 percentage points more likely to participate fully in their communities, and 22 percentage points less likely to be inactive than youth with similar characteristics who spent half of their time in regular education. Taking college preparatory courses, another form of regular education, also benefited physically impaired youth; it was related to a 26 percentage point higher probability of college attendance.

Vocational education demonstrated few benefits for these youth; rather, concentrating in a vocational area was associated with a 27 percentage point lower likelihood of postsecondary academic education, with no corresponding increase in the probability of obtaining vocational education or competitive employment. However, work experience was a plus in the programs of youth with physical disabilities. Perhaps work experience showed the capacity of physically impaired youth to perform specific jobs, a "real world" application that was not associated with classroom vocational education. As such, work experience was related to a 33 percentage point higher likelihood of employment and with earnings that were more than $4,000 higher than those of similar youth who did not have high school work experience.

Youth with Severe Disabilities

The postschool outcomes of youth with this cluster of more severe disabilities generally were not as sensitive to the influence of individual or household characteristics as were the outcomes of other youth with disabilities. Perhaps because their outcomes were markedly poorer than those of other youth, being female or a minority or a parent did not have the further negative effects for these youth that were noted for youth with some other clusters of disabilities. However, economic disadvantage and coming from a single-parent household did have negative effects on employment outcomes, even for youth with severe disabilities. Lower-income youth with severe disabilities were significantly less likely to find jobs and earned significantly less than did youth with similar characteristics who were from higher-income households. Parental expectations had a powerful offsetting positive influence, however. Youth with severe impairments who were similar in other ways measured in the analyses and who had high parent expectations for their future were 57 percentage points more likely to go on to postsecondary academic education, 25 percentage points more likely to live independently, and 55 percentage points more likely to be full participants in their communities than youth whose parents had lower expectations.

This was the only cluster of youth to have a significant relationship between attending special schools and outcomes, showing a poorer outcome for special school students, who had a significantly higher likelihood of being inactive in the community (29 percentage points) than regular school students, with other factors controlled. Consistent with the apparent benefits of regular school attendance for youth with severe impairments, spending more time in regular education classes also seemed beneficial with regard to community participation; those who spent all their time in regular education classes were 24 percentage points more likely to achieve full community participation than youth who spent half their time there, independent of other differences between them. Taking advanced academic courses, vocational concentrations, work experience programs did not benefit these youth with regard to any postschool outcome. Even time did not work in their favor. Youth with this cluster of disabilities who had been out of school 3 years were estimated to be 19 percentage points less likely to be fully participating in their communities than similar youth out of school only 1 year.

The differences in relationships between postschool outcomes and various explanatory factors noted above demonstrate that there is no single answer to the question "what works?" in secondary school programming for young people with disabilities. We have shown that some aspects of school programs "work" in that they appear to contribute to more positive postschool outcomes, but often for only some kinds of youth and some of the outcomes. For example, vocational education appears to have had real benefits for youth with mild disabilities, but no such benefits for those with sensory impairments. Further, these benefits related to postschool employment, but not to several of the other postschool outcomes we have analyzed. Similarly, spending time in regular education classrooms showed strong positive associations with postschool employment for youth with physical or severe disabilities, but not youth with mild impairments, and it had little relationship to the likelihood that most youth would enroll in postsecondary education programs. Clearly, the needs and interests of youth with disabilities and the postschool paths they took were too varied and complex to be uniformly amenable to influence by any particular school programming option. Individualization of programs must continue to be the hallmark of special education policies and programs if they are to be well suited to the diversity of the students they are intended to benefit. Programs or policies meant to fit "all students" are unlikely to do so.

The NLTS findings also suggest that schools and school programs should not alone be held responsible for the successes or failures youth are perceived to have in their transitions to adulthood. The critical role of parents in supporting their children with disabilities through school and beyond is underscored by the results reported here. Youth who had parents who were more supportive of them educationally while they were in school and who had higher expectations for them when they left school reaped benefits from that kind of parenting. Both parental involvement in education and high parental expectations were each independently associated with a higher likelihood that youth would receive postsecondary vocational training and a significantly lower likelihood that they would be inactive in the community after high school. Parental expectations had further strong influences, independent of household income or other factors, on the likelihood that youth would attend postsecondary academic programs, live independently, or achieve the highest level of community participation measured in the NLTS. These benefits are among the most powerful positive influences we identified in our analyses. They accrued to youth, regardless of the particular disability challenges they faced, and regardless of the limitations of minority status, gender, or economic disadvantage. Parents made a difference. One potentially effective avenue to improving the outcomes of youth is to strengthen their parents' awareness of their own important role in the lives of their children and their ability to exercise that role effectively on their children's behalf.

Finally, the puzzle of postschool outcomes, as set out here, has a missing piece—the adult service system. Leaving secondary school does not necessarily mean that youth with disabilities have received the last professional support they can get to help them in transition. There are numerous adult service organizations, some of which provide services to the population as a whole (e.g., some job training programs), some of which serve persons with disabilities fairly broadly (e.g., state Vocational Rehabilitation agencies), and some of which serve persons with specific disabilities (e.g., the Lighthouse for the Blind). Receiving services of various kinds from one or more of these organizations may have helped some youth achieve the postschool outcomes we measured, an aspect of their experience that was not included in the analyses reported here.*

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* The NLTS collected information about a variety of adult services that youth might have received after leaving high school. However, it was not feasible to determine precisely when youth received each service or for how long. Thus, adult service information could not be included in the analyses reported here because it was unclear whether the services preceded the outcomes measured, a prerequisite to considering them as possible explanatory variables.

However, other NLTS analyses have demonstrated a widely held perception of unmet need for a variety of services investigated by the NLTS (Marder, Wechsler, and Valdés, 1993).[*] Overall, 70% of youth with disabilities who had been out of secondary school up to 5 years had parents who reported that the youth needed one or more of the services we investigated. Vocational assistance was the most commonly reported need (by 60%) of youth, followed by life skills training (43% of youth). Only about one-third of youth who were reported to need vocational assistance were receiving it; only about one-fourth or fewer of youth who were perceived to need various other services were receiving them. Further, those who were more frequently reported to need services (e.g., youth with serious emotional disturbances, youth who were African American, youth who had dropped out of school) often were the least likely to be receiving them. This high level of unmet need for adult services underscores another potentially effective avenue for improving the postschool outcomes of young people with disabilities. Increasing the awareness of parents and youth regarding available services and improving the connections—through transition planning while in secondary school—between youth with disabilities and services for which they are eligible might bridge some of the large gap between the level of need and the level of services that were reported by parents to the NLTS.

These analyses from the NLTS document the early postschool outcomes that were achieved by young people with disabilities who had gone through secondary school in the mid to late 1980s. We have shown that the school programs they experienced at that time influenced, sometimes considerably, some of their later outcomes. But American education is undergoing considerable reform in many places across the country. School programs are changing for many students in high schools, whether or not they have disabilities. For secondary school students with disabilities, specific initiatives, such as the relatively recent mandate to incorporate transition planning into secondary school programming and continued efforts to increase the degree to which students with disabilities are included in regular education settings, could markedly reshape their secondary school experiences. A continuing look at school programs, student outcomes, and later postschool achievements will be needed if we are to keep up with changes in programs and document their evolving relationships to the outcomes of youth with disabilities.

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[*] Services included vocational assistance (e.g., job training, job placement); life skills training or occupational therapy; personal counseling or therapy; help from a reader, tutor, or interpreter; and physical therapy or mobility training.

References

Marder, C., Wechsler, M, and Valdés, K. (1993). *Services for youth with disabilities after secondary school. A special topic report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Wagner, M., Blackorby, J., and Hebbeler, K. (1993). *Beyond the report card: The multiple dimensions of secondary school performance of students with disabilities. A report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Wagner, M., Newman, L., D'Amico, R., Jay, E. D., Butler-Nalin, P., Marder, C. and Cox, R. (1991). *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

APPENDIX

SUPPLEMENTAL STATISTICAL TABLES

Appendix Table 1

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - MAIN MODEL

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Disability category							
Emotional disturbance	-0.34	-0.47	-0.44	-2,204.07 *	-0.22	-0.49 †	0.92 **
Speech impairments	0.83 *	-0.26	-0.02	-1,495.04	0.22	0.50	0.00
Mild/moderate mental retardation	-0.88	-1.58 ***	-0.33	-2,312.95 **	-0.73 *	-0.79 ***	0.78 **
Hard of hearing	1.04 ***	0.03	-0.44	-2,875.08 ***	-0.14	-0.41	-0.32
Deaf	1.09 ***	0.17	-0.92 **	-3,671.44 ***	0.15	0.05	0.23
Visual impairments	1.49 ***	-0.20	-0.82 *	-2,765.61 **	0.19	0.09	0.02
Orthopedic impairments	0.55 †	-0.49	-1.09 **	-4,065.14 ***	-0.70 *	-0.98 ***	0.84 *
Other health impairments	0.61	-0.13	-0.09	-1,570.33	-0.63 †	-0.79 **	0.61
Severely impairments	0.14	-1.26 *	-0.71 †	-3,166.91 **	-0.50	-0.82 *	0.52
Functional skills							
Functional mental skills scale score	0.05	-0.02	0.00	30.93	0.01	-0.01	0.05
Self-care ability score	-0.11 †	0.09	0.48 ***	601.61 **	0.09	0.02	-0.08
Demographic characteristics							
Youth was male	0.04	-0.08	0.21	1,814.45 ***	-0.29 *	0.21	0.13
Youth was African American	0.10	-0.02	-0.51 *	-1,016.50 †	-0.38 †	-0.46 *	0.60 **
Youth was Hispanic	-0.08	0.49 †	-0.02	-22.58	-1.02 ***	-0.70 **	0.40
Parenting status							
Youth was a mother	-1.11 **	-0.55	-1.67 ***	-1,939.78 *	1.41 ***	0.42	0.43
Youth was a father	-1.80 ***	0.06	-0.07	818.41	1.29 ***	0.15	0.00
Household characteristics							
Student was from a single-parent household	-0.41 *	-0.15	0.27	456.56	-0.06	0.01	-0.01
Household income (5 category scale)	0.15 ***	0.09 †	0.04	253.27 *	0.02	0.09 *	-0.12 *
Parental expectations							
Parent expected youth to attend postsecondary school	1.65 ***	0.40 *	n/a	n/a	n/a	n/a	n/a
Parent expected youth to be competitively employed	n/a	n/a	-0.27	-941.74	n/a	n/a	n/a
Parent expected youth to live independently	n/a	n/a	n/a	n/a	0.63 *	n/a	n/a
Sum total of parent's expectations	n/a	n/a	n/a	n/a	n/a	0.48 ***	-0.25 *

Appendix Table 1 (concluded)

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - MAIN MODEL

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Student behaviors							
Student belonged to a school/community group	1.00 ***	-0.31 †	0.07	235.30	0.35 *	0.32 *	-0.38 *
Frequency of seeing friends	-0.04	-0.13 *	0.06	201.44	0.06	0.09 *	0.06
School outcomes							
Student was a dropout	-0.59	-0.74 *	-0.32	-1,023.21	-0.13	-0.85 ***	0.57 *
School programs							
Percentage of time in regular education classes	0.00	0.00	0.01 **	41.89 ***	0.00	0.01 ***	0.00
Youth took an advanced math or foreign language class in secondary school	0.96 ***	-0.42 †	0.17	174.71	0.78 ***	0.69 ***	-0.63 *
Student took a concentration in one or more occupational vocational education content areas	0.09	0.47	0.77 *	1,851.29 †	-0.24	0.42	-0.33
Student took survey courses in occupational vocational education	0.49	0.50	0.80 *	1,097.43	-0.25	0.48 †	-0.34
Student participated in a work experience program	-0.45 *	0.26	-0.08	541.50	0.27	0.17	-0.07
School characteristics							
Proportion of school population living in poverty	0.18 †	0.14	-0.09	4.15	-0.04	0.05	0.00
Youth attended a special school	-0.09	0.03	-0.31	636.60	0.71 *	0.23	0.39
Time out of secondary school							
Number of years since leaving school	0.16 †	0.33 ***	0.17 †	649.91 **	0.29 ***	0.06	-0.02

† p < .10; * p < .05; ** p < .01; *** p < .001

Appendix Table 2

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - MILD CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Functional skills							
Functional mental skills scale score	0.04	0.03	0.13 *	465.30 *	-0.06	0.02	-0.01
Self-care ability score	-0.15	-0.40 *	0.87 **	846.62	0.79 *	0.18	-0.20
Demographic characteristics							
Youth was male	-0.01	-0.08	-0.06	2,602.87 ***	-0.08	0.74 **	-0.13
Youth was African American	0.11	-0.03	-0.53 †	-1,680.18 †	-0.25	-0.52	0.54
Youth was Hispanic	-0.34	0.11	-0.48	-1,661.19	-0.64	-0.74 †	0.75
Parenting status							
Youth was a mother		-1.36	-2.29 ***	-3,078.89 †	2.64 ***	1.09 †	-0.15
Youth was a father	-1.80 ***	0.06	-0.07	818.41	1.29 ***	0.15	0.00
Household characteristics							
Student was from a single-parent household	-0.68 †	-0.28	0.20	-614.85	0.24	-0.17	0.06
Household income (5 category scale)	0.19 *	0.10	0.00	381.27 *	0.00	0.00	-0.09
Parental expectations							
Parent expected youth to attend postsecondary school	1.45 ***	-0.03	n/a	n/a	n/a	n/a	n/a
Parent expected youth to be competitively employed	n/a	n/a	n/a	889.54	n/a	n/a	n/a
Parent expected youth to live independently	n/a	n/a	n/a	n/a	1.28 *	n/a	n/a
Sum total of parent's expectations	n/a	n/a	n/a	n/a	n/a	0.42 *	-0.33
Student behaviors							
Student belonged to a school/community group	0.94 **	0.02	0.20	1,166.12	0.22	0.41 †	-0.92 ***
Frequency of seeing friends	-0.07	-0.01	0.11	420.53 †	0.01	0.07	0.05
School outcomes							
Student was a dropout	-1.19 *	-0.50	-0.14	-617.31	-0.37 *	-0.90 **	0.80 *

Appendix Table 2 (concluded)

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
School programs							
Percentage of time in regular education classes	0.01	0.02 **	0.00	13.65	0.01 †	0.01 ***	0.00
Youth took an advanced math or foreign language class in secondary school	1.41 ***	0.05	-0.12	-1,384.41	1.00 ***	0.95 **	-0.57
Student took a concentration in one or more occupational vocational education content areas	-0.38	0.97	1.98 ***	6,247.06 ***	-0.25	0.86	-1.13 *
Student took survey courses in occupational vocational education	0.24	0.83	1.51 **	3,993.25 *	-0.40	0.85 †	-0.78
Student participated in a work experience program	-0.53	0.09	0.46 †	1,379.19	0.16	-0.03	0.11
School characteristics							
Proportion of school population living in poverty	0.22	0.21	-0.15	378.53	-0.04	-0.09	0.13
Time out of secondary school							
Number of years since leaving school	-0.06	0.12	0.17	1,233.31 **	0.38 **	0.06	-0.07

† p < .10; * p < .05; ** p < .01; *** p < .001

Appendix Table 3

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - SENSORY CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Functional skills							
Functional mental skills scale score	-0.01	0.01	-0.03	-111.08	0.00	-0.03	0.03
Self-care ability score	0.06	0.22	0.23	610.79 *	0.07	0.23	-0.09
Demographic characteristics							
Youth was male	-0.06	0.01	0.22	1,188.08 *	-0.15	0.01	0.43
Youth was African American	0.27	0.05	-0.66 *	-1,020.42	-0.28	-0.44	0.85 *
Youth was Hispanic	-0.05	0.50	0.01	-440.50	-0.98 *	-0.49	0.45
Parenting status							
Youth was a mother	-1.30	-0.05	-0.50	71.98	0.72	-0.17	0.85
Household characteristics							
Student was from a single-parent household	-0.30	-0.35	-0.14	36.26	-0.19	-0.19	0.42
Household income (5 category scale)	0.18	0.11	0.05	126.44	0.03	0.25 ***	-0.27 **
Parental expectations							
Parent expected youth to attend postsecondary school	1.78 *	0.73 *	n/a	n/a	n/a	n/a	n/a
Parent expected youth to be competitively employed	n/a	n/a	-0.47	-2,064.92	n/a	n/a	n/a
Parent expected youth to live independently	n/a	n/a	n/a	n/a	0.22	n/a	n/a
Sum total of parent's expectations	n/a	n/a	n/a	n/a	n/a	0.37 †	-.07
Student behaviors							
Student belonged to a school/community group	1.06	-0.20	-0.17	-1,144.44 *	0.22	0.42	0.06
Frequency of seeing friends	-0.15 *	-0.19 *	0.03	43.41	0.01	-0.15 †	0.33 **
School outcomes							
Student was a dropout	-0.06	-0.41	0.07	-0.90	0.19	-1.03 **	0.16

Appendix Table 3 (concluded)

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - SENSORY CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
School programs							
Percentage of time in regular education classes	0.00	0.00	0.01 *	31.01 **	0.00	0.01	0.00
Youth took an advanced math or foreign language class in secondary school	0.77	-0.53	-0.15	-653.59	0.92 ***	0.95 **	-1.30 *
Student took a concentration in one or more occupational vocational education content areas	-0.11	0.26	0.63	1,070.85	-0.43	-0.17	-1.03
Student took survey courses in occupational vocational education	0.09	0.29	0.73	1,021.09	-0.38	-0.10	-0.94
Student participated in a work experience program	0.04	0.20	-0.50	-697.13	0.28	0.18	0.55
School characteristics							
Proportion of school population living in poverty	0.07	-0.05	-0.02	-93.19	0.07	0.15	-0.06
Youth attended a special school	-0.28	-0.23	-0.04	553.73	0.57	0.47	0.13
Time out of secondary school							
Number of years since leaving school	0.07 †	0.28 †	0.18	615.05 *	0.19	0.02	0.23

† p < .10; * p < .05; ** p < .01; *** p < .001

Appendix Table 4

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - PHYSICAL CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Functional skills							
Functional mental skills scale score	0.02	-0.50	-0.30 *	-211.89	-0.10	-0.28 †	0.35 *
Self-care ability score	-0.19 †	0.26	0.52 **	535.45 **	0.26	-0.08	-0.03
Demographic characteristics							
Youth was male	0.37	-0.14	0.45	704.84	-0.83 †	0.25	-0.51
Youth was African American	-1.22 †	-0.95	0.73	1,373.03	0.11	-1.21 †	0.50
Youth was Hispanic	0.09	-0.71	2.23 **	3,054.26 **	-0.60	-1.53 *	0.22
Parenting status							
Youth was a mother	4.01 *	n/a	n/a	-4,275.87	n/a	1.78	1.06
Household characteristics							
Student was from a single-parent household	-0.31	1.24	0.32	718.53	-0.17	1.11 *	-1.03
Household income (5 category scale)	0.17	0.04	0.21 †	367.72 †	-0.05	-0.08	0.04
Parental expectations							
Parent expected youth to attend postsecondary school	1.71 ***	2.30 **	n/a	n/a	n/a	n/a	n/a
Parent expected youth to be competitively employed	n/a	n/a	1.01	1,729.49	n/a	n/a	n/a
Parent expected youth to live independently	n/a	n/a	n/a	n/a	0.00	n/a	n/a
Sum total of parent's expectations	n/a	n/a	n/a	n/a	n/a	1.33 ***	-0.36
Student behaviors							
Student belonged to a school/community group	0.42	-1.67 **	0.30	894.96	1.71 **	0.38	-0.95 †
Frequency of seeing friends	0.09	-0.34	0.58 ***	612.53 *	0.29	0.31 *	-0.09
School outcomes							
Student was a dropout	-1.30	-0.66	-0.76	1,398.93	0.43	-0.62	-0.42

Appendix Table 4 (concluded)

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - PHYSICAL CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
School programs							
Percentage of time in regular education classes	0.02	0.02	0.04 **	33.29 *	0.02	0.04 **	-0.03 **
Youth took an advanced math or foreign language class in secondary school	1.07 *	-1.46 *	-0.08	140.37	0.18	0.78	-0.86
Student took a concentration in one or more occupational vocational education content areas	-1.26 *	-0.15	-0.23	2,009.50 *	-0.74	-0.18	0.34
Student participated in a work experience program	-1.46 *	0.20	1.35 *	4,195.64 ***	0.65	0.53	-1.17
School characteristics							
Proportion of school population living in poverty	0.27	0.25	-0.13	-164.06	-1.08 **	0.15	-0.02
Youth attended a special school	-1.98	0.00	1.10	1,394.57		0.59	-0.05
Time out of secondary school							
Number of years since leaving school	0.13	1.29 **	0.51 †	623.91	0.82 **	0.06	-0.57 †

† p < .10; * p < .05; ** p < .01; *** p < .001

Appendix Table 5

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - SEVERE CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Functional skills							
Functional mental skills scale score	-0.09	0.16	0.07	-8.46	0.28	0.11	-0.07
Self-care ability score	-0.38 *	0.06	0.27	434.68 †	-0.35 *	-0.42 **	-0.04
Demographic characteristics							
Youth was male	0.73	-0.05	0.38	747.00	-0.83	-0.72	0.53
Youth was African American	-0.92	0.30	-0.14	-384.77	n/a	0.15	0.13
Youth was Hispanic	-1.83	0.81	0.24	1,309.69	n/a	-0.78	0.13
Youth was minority	n/a	n/a	n/a	n/a	-0.90	n/a	n/a
Parenting status							
Youth was a mother	1.16	n/a	n/a	-240.51	0.48	0.27	1.29
Household characteristics							
Student was from a single-parent household	0.21	-0.35	-0.44	-1,468.18 †	-0.61	-0.08	0.67
Household income (5 category scale)	0.18	0.06	0.25 †	516.03 **	0.18	0.18	-0.33 *
Parental expectations							
Parent expected youth to attend postsecondary school	3.48 ***	0.78	-0.49	n/a	n/a	n/a	n/a
Parent expected youth to be competitively employed	n/a	n/a	1.01	-1,219.35	n/a	n/a	n/a
Parent expected youth to live independently	n/a	n/a	n/a	n/a	2.50 ***	n/a	n/a
Sum total of parent's expectations	n/a	n/a	n/a	n/a	n/a	0.89 **	-0.30
Student behaviors							
Student belonged to a school/community group	1.48	-0.45	-0.75	-840.38	-0.24	-0.35	0.40
Frequency of seeing friends	0.34	-0.01	0.13	402.51 *	0.09	0.39 **	-0.05

Appendix Table 5 (concluded)

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POST SCHOOL OUTCOMES - SEVERE CLUSTER

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
School programs							
Percentage of time in regular education classes	0.00	0.01	0.00	15.10	-0.01	0.02 *	-0.01
Youth took an advanced math or foreign language class in secondary school	0.64	-1.55	0.40	1,282.39	0.95	-1.05	1.48
Student took a concentration in one or more occupational vocational education content areas	0.66	-0.78	-0.42	-1,246.35	-1.19	-0.22	1.10 †
Student participated in a work experience program	-0.97	0.40	-0.17	-334.74	0.24	0.24	-0.19
School characteristics							
Proportion of school population living in poverty	0.69	0.17	-0.18	-236.61	0.06	0.09	0.09
Youth attended a special school	-1.97	-0.66	-1.16	266.46	-0.27	-0.60	1.37 *
Time out of secondary school							
Number of years since leaving school	0.50	0.22	0.08	-45.38	-0.09	-0.46 †	0.39

† p < .10; * p < .05; ** p < .01; *** p < .001

Appendix Table 6

PARTIAL REGRESSION COEFFICIENTS AND LOGISTIC REGRESSION COEFFICIENTS IN MULTIVARIATE MODELS ON POSTSCHOOL OUTCOMES - TEACHER SURVEY MODELS[a]

	Estimated Change in:						
	Postsecondary Academics (Logistic regression coefficients)	Postsecondary Vocational (Logistic regression coefficients)	Employment (Logistic regression coefficients)	Total Compensation (Partial regression coefficients)	Independent Living (Logistic regression coefficients)	Profile A or B (Logistic regression coefficients)	Profile E (Logistic regression coefficients)
Transition Planning							
Score on transition planning scale	0.23	0.00	-0.38	-798.64	0.07	0.28	-0.25
Transition goal was postsecondary academics	1.11 *	n/a	n/a	n/a	n/a	n/a	n/a
Transition goal was postsecondary vocational training	n/a	0.78 *	n/a	n/a	n/a	n/a	n/a
Transition goal was competitive employment			0.32	n/a	n/a	n/a	n/a
School contacted postsecondary academic institutions	1.40 *	n/a	n/a	n/a	n/a	n/a	n/a
School contacted postsecondary vocational institutions	n/a	0.66	n/a	n/a	n/a	n/a	n/a
School contacted employers	n/a	n/a	0.48	n/a	n/a	n/a	n/a
Parent involvement							
Level of parental involvement in students secondary education	0.24	0.66 **	0.26	-361.51	0.15	0.00	-0.89 **
Student behavior							
Score on in-class behavior scale	0.06	0.15	0.17	130.05	0.04	0.21 †	-0.21
Score on task-related behavior scale	0.22 †	0.05	0.02	565.80 †	-0.06	-0.11	-0.04
Student Performance							
Years behind in reading	0.01	0.06	-0.15	-237.21	0.05	-0.03	0.15
Years behind in math	-0.04	-0.07	-0.06	39.60	-0.14	0.10	-0.18
Cumulative grade point average	0.65 †	0.35	0.27	1,267.63	0.40 *	-0.22	-0.02

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[a] The coefficients reported here derive from 9 models based on teacher survey variables. Each of the models included variables from the main model. Teacher survey variables were added separately in order to assess the impact of each individually. Of course, these analyses also produced coefficients relating to variables from the main model. Space does not allow them to be reproduced here.

† p < .10, * p < .05, ** p < .01, *** p < .001

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